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Article

AI governance in African higher education: Status, challenges, and a future-proof policy framework

Sixbert SANGWA[1,*] , Dennis Ngobi[2], Emmanuel Ekosse[3], Placide Mutabazi[4]

[1] Department of International Business and Trade, African Leadership University, Kigali 00004, Rwanda
[2] Department of Entrepreneurial Leadership, African Leadership University, Kigali 00004, Rwanda
3 Department of International Business and Trade, African Leadership University, Kigali 00004, Rwanda
4 Department of Business Theology, Open Christian University, Sacramento CA 95811, USA
*** Corresponding author:** Sixbert SANGWA, ssangwa@alueducation.com

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Abstract: As artificial intelligence (AI) reshapes global education systems, African higher education institutions (HEIs) face pressure to adopt and govern AI ethically and effectively. This study investigates five questions: (1) What is the status of AI governance in African HEIs? (2) How ready are institutions to adopt AI policy? (3) What ethical and operational risks are emerging? (4) How do institutional and national AI strategies align? and (5) What future-proof governance framework can be proposed? Using a desk-based meta-synthesis, the study analyzes over 30 publicly available institutional, national, and regional documents. The analysis is guided by Resource Dependence Theory, Diffusion of Innovation, and Complexity Theory. No human subjects were involved, and international ethical standards were followed; PRISMA guidelines were deemed not applicable due to the qualitative scope. Findings reveal wide disparities in policy development and readiness. South Africa, Nigeria, and Rwanda are early adopters, aligning institutional policies with national digital strategies (RQ1 & RQ4). Most institutions remain in aspirational phases, limited by infrastructure and human capacity (RQ2). Where policies exist, they emphasize academic integrity and responsible use, though enforcement is uneven and impact largely unevaluated (RQ3). Cross-national alignment varies, with regional frameworks lacking strong enforcement mechanisms (RQ4). Evidence suggests that institutions with structured policies invest more in training and faculty engagement (RQ2 & RQ5). The study proposes a phased, ethically grounded governance framework tailored to Africa's educational context (RQ5). It contributes new insights into readiness differentials, governance diffusion, and policy convergence, offering a foundation for inclusive, future-oriented AI policy in African higher education.

Keywords: AI governance in higher education; artificial intelligence policy in Africa; university readiness for AI adoption; ethical AI in African universities; digital transformation in higher education; AI policy diffusion in Africa; contextual AI governance framework

1. Introduction

Artificial intelligence is transforming higher education globally, raising urgent questions about governance, ethics, and policy. In Africa, the conversation around AI in universities has accelerated in recent years amid the twin realities of opportunity and challenge. On one hand, AI tools like intelligent tutoring systems, automation in administration, and generative models (e.g., OpenAI's ChatGPT) promise to enhance teaching, learning, and research. These tools have already gained a foothold among African students and faculty: for instance, a recent Stanford AI Index report found that 27% of Kenyans use ChatGPT daily, the third-highest rate globally [1]. Such statistics underscore a rapidly growing interest and unofficial

adoption of AI, even as formal governance frameworks lag behind, creating risks of academic misconduct and unequal access. This growing adoption reflects a broader trend in recognizing the educational potential of AI, which extends to interactive technologies such as social robots that can enhance personalized learning experiences, as discussed in the research on the educational value of AI and social robots [1,2]. On the other hand, the rise of AI has sparked concerns across the continent about academic integrity, quality of education, and the digital divide. These concerns are not unique to Africa. A recent study by Lavidas et al. [3] found that even in technologically advanced environments, students' intention to use AI tools is strongly influenced by ethical concerns, digital preparedness, and institutional support structures. Integrating such global insights into Africa's policy development process can provide a useful mirror for adaptation and contextualization. University instructors worry about students handing in AI-generated essays, policymakers fear widening inequality between well-resourced and poorly resourced institutions, and ethicists caution against biases and opaque algorithms infiltrating academia [4,5].

The urgency of these issues is increasingly recognized by educational leaders. Tellingly, the Association of African Universities (AAU) chose "artificial intelligence in African higher education" as the theme for the 2023 African Universities Day celebrations [6]. This continent-wide event spotlighted how emerging technologies like AI are *"impacting teaching, learning, research, collaboration, lifelong learning, ethics and privacy"* and called on African HEIs to "adopt progressive strategies to guide the usage and integration of emerging technologies such as AI" [6]. Yet, as universities attempt to formulate responses, they operate in a context of constrained resources and uncertainty. Many African HEIs have limited access to high-speed internet and advanced computing, rely on outdated policies ill-suited to digital tools, and lack faculty trained in AI literacy [7,8]. The COVID-19 pandemic further highlighted these gaps—when learning moved online in 2020, an estimated seven million African university students (about most public university students in Sub-Saharan Africa) struggled to access classes due to connectivity and device limitations [8]. Such infrastructural and capacity challenges add complexity to the governance of any new technology.

Against this backdrop, this article investigates the status, challenges, and future directions of AI governance in African higher education. We define AI governance in HEIs as the institutional policies, practices, and oversight mechanisms that guide the development and use of AI tools in teaching, learning, research, and administration in a manner consistent with educational goals and ethical values. Key questions addressed include: *What is the prevalence of AI policies in African universities, and what is the nature of these policies? What key benefits and concerns do stakeholders (educators, students, leaders) perceive regarding AI adoption in African HEIs? How prepared are institutions in terms of technology, management, and culture to implement AI responsibly? What ethical risks does AI pose in the university context, and how are institutions responding to issues like cheating or misinformation? What legal and data governance frameworks shape AI use in African HEIs?* Finally, *what policy framework could guide the future integration of AI in a way that is sustainable, equitable, and tailored to African contexts?*

To tackle these questions, we adopt an interdisciplinary approach. The analysis synthesizes evidence from peer-reviewed studies, surveys, institutional reports, and policy documents, ensuring a data-informed perspective. Uniquely, we ground our discussion in three theoretical lenses—Resource Dependence Theory (RDT), Diffusion of Innovation Theory, and Complexity Theory—to gain deeper insight into the forces influencing AI adoption and governance in African universities. RDT helps explain how external resource constraints and incentives (e.g., funding, technology access, global pressures) shape university decisions [9]. Diffusion of Innovation theory sheds light on the spread (or lack thereof) of AI policies and practices across institutions and regions, highlighting the roles of early adopters and social networks in driving change. Complexity Theory, meanwhile, frames the higher education system as a complex adaptive system, where implementing AI can have nonlinear, unpredictable effects, requiring flexible and adaptive governance strategies [10,11].

The structure of the article is as follows. First, we outline the conceptual framework, elaborating on the three theories and how they inform our analysis. Next, we describe the methodology, which is primarily a qualitative meta-analysis of existing data and literature, supplemented by illustrative quantitative indicators. We then present findings and discussion in five parts: (1) the prevalence of AI policies in African universities, including regional variations and the nature of policy provisions; (2) benefits and concerns related to AI in academia as voiced by key stakeholders; (3) institutional readiness for AI governance, examining infrastructure, administrative capacity, and cultural attitudes; (4) ethical risks and responses, focusing on academic dishonesty, AI hallucinations, and data privacy issues; and (5) the legal and data governance landscape impacting AI in African HEIs, from national laws to international guidelines. Building on these findings, we propose a comprehensive policy framework for AI integration in African higher education that aims to be future-proof and ethically grounded. Finally, we offer conclusions and recommendations, as well as suggestions for future research to continue this important inquiry. The goal is to provide African universities, policymakers, and scholars with a rigorous, insightful foundation to navigate AI's promise and perils in higher education for years to come. Unlike prior studies that address AI ethics or adoption in isolated contexts, this paper synthesizes governance readiness continent-wide, providing a policy model sensitive to resource disparity and institutional diversity.

2. Conceptual framework

In order to analyze AI governance in African higher education institutions, we employ a conceptual framework informed by organizational and innovation theories that illuminate different facets of this complex phenomenon. Specifically, Resource Dependence Theory, Diffusion of Innovation Theory, and Complexity Theory serve as the theoretical pillars of our investigation. Each offers a distinct lens: RDT emphasizes external resources and power dynamics, diffusion theory focuses on patterns and drivers of adoption, and Complexity Theory underscores the non-linear and systemic nature of change. Together, these perspectives provide a holistic

understanding of why and how African universities are responding (or not responding) to AI and what strategies might be effective in the uniquely challenging environment of African higher education.

2.1. Resource Dependence Theory (RDT):

RDT posits that organizations are open systems, reliant on resources from their external environment, and that this dependence influences their behavior and decisions [11]. In the African university context, RDT suggests that decisions around AI adoption are often influenced by donor agendas, government AI policies, and international partnerships. Universities, like other organizations, must secure various resources—funding, technology, human talent, and legitimacy—to survive and thrive. African universities often depend heavily on government allocations, international donors, partnerships with industry, and global networks for such resources. RDT suggests that the degree of autonomy an institution has in setting policies (like AI governance) is constrained by the need to align with the interests or requirements of resource providers [9]. We can thus hypothesize that an African HEI with substantial government funding or donor support earmarked for technological innovation might be more inclined to develop an AI strategy (to satisfy those external expectations), whereas a resource-starved university might prioritize basic needs over emerging tech governance. Moreover, external actors—governments, EdTech companies, NGOs—who provide AI tools or related grants can exercise power. For example, if a ministry of education issues guidelines on AI use in curricula as a condition for budget support, public universities would feel pressured to comply. RDT also highlights strategies organizations use to manage resource dependencies, such as forming alliances, lobbying, or diversifying funding sources [9]. In our context, an African university consortium could collectively negotiate discounts with AI software vendors (alliance to reduce dependence on costly licenses), or a university might seek multiple smaller funding sources for digital initiatives to avoid over-reliance on a single donor. By applying RDT, we will examine how external resource availability (e.g., ICT infrastructure funding, training programs, or policy mandates) and constraints affect the adoption of AI governance measures in African HEIs. This theory helps frame AI governance not just as a purely internal choice based on pedagogical considerations, but also as an outcome of external pressures, incentives, and power relations in the higher education ecosystem.

2.2. Diffusion of Innovation Theory:

The Diffusion of Innovation (DoI) theory explains how new ideas and technologies spread across social systems. In the context of AI governance in African higher education, this theory helps identify how institutions adopt and normalize AI policy at varying speeds. Early adopters—often those with greater international partnerships and internal digital maturity—tend to influence regional peers. Understanding these adoption patterns is essential to contextualizing Africa's fragmented yet accelerating AI policy landscape. We expect, for instance, that a handful of innovative universities (perhaps top-tier research universities or those with strong global linkages) will be *"early adopters"* of AI policies, setting precedents that others may follow. Studies such as Lampropoulos and Papadakis [12], show that institutions most successful in adopting AI and educational robotics

tend to integrate stakeholder training, ethics, and structured policy experimentation into their implementation process. This supports our assertion that early adopters among African HEIs are likely those with exposure to international collaboration and deliberate change management strategies. Indeed, evidence suggests significant variation in how quickly universities worldwide have responded to the emergence of generative AI: a recent analysis of the top 500 universities found that less than one-third had implemented any policy on ChatGPT within the first half-year of its release, and among those with policies, about two-thirds chose an embracing approach (allowing or encouraging use with guidance) rather than bans [13]. This indicates a diffusion process in its early stages globally. Within Africa, diffusion theory would predict that those institutions with greater exposure to the innovation (e.g., through international faculty, conferences, or early experimentation) would adopt AI guidelines sooner, and that over time, through channels like academic networks and associations, awareness and adoption will spread to more universities. The theory also considers social influence and peer effects—African universities often look to exemplars in the region or aspirational peers for guidance. For example, when several leading South African universities published generative AI guidelines in 2023–2024, it likely alerted other universities in Africa to the issue and provided models that could be adapted [14]. Diffusion is also impacted by contextual factors; in many African institutions, the perceived relative advantage of AI in education might be mixed (high potential benefits but also high risk of misuse), and the compatibility with local practices (e.g., traditional exam-based assessment) might be low, slowing diffusion. By using Diffusion of Innovation as a lens, we can interpret the current patchwork of AI policy adoption among African HEIs as part of an ongoing process, identify who the innovators/early adopters are and why, and gauge how the innovation might move into the majority. It also underscores the role of knowledge-sharing and capacity-building: diffusion can be accelerated by proactive dissemination of success stories, guidelines, and evidence of impact among universities.

2.3. Complexity Theory:

Higher education systems can be viewed as complex adaptive systems, characterized by many interacting components (students, faculty, departments, administration, government, society), non-linear dynamics, feedback loops, and emergent behavior. Complexity Theory suggests that in such systems, changes do not result in proportional or entirely predictable outcomes because of interdependencies and the adaptive behavior of agents. As one education governance analysis notes, “Complexity Theory reveals that a significant degree of complexity in a system—whether an education system or a school—leads to emergent properties”, and traditional linear policy approaches often fail to produce intended results [15,10]. In the context of AI governance in universities, a complexity perspective urges caution against one-size-fits-all or static policies. The introduction of AI tools could have cascading effects: for example, allowing AI-assisted writing in assignments might change student study habits, which in turn could influence how instructors design assessments, which could affect grading patterns and even the skills that graduates take into the job market. These interconnections mean that AI governance needs to be adaptive. Imposing strict bans or rigid rules may lead to

unexpected "workarounds" or inequitable outcomes, as seen in other complex domains where stakeholders adapt to rules in unanticipated ways [10]. A complexity lens also highlights the importance of continuous learning and feedback. Universities should monitor how AI is actually being used and misused on the ground and be prepared to iteratively adjust policies. For instance, an initial guideline may permit AI usage with attribution, but if monitoring reveals widespread uncredited use, the institution might need to tighten academic integrity enforcement or increase training on citation practices. Conversely, if a ban leads to students hiding their usage and not seeking help, a policy shift to a more permissive, educative approach might emerge. Complexity Theory aligns with concepts like systemic thinking and collective leadership—effective governance in a complex environment often requires input and cooperation from multiple stakeholders rather than top-down edicts. We see this in calls for involving faculty, IT staff, students, and even external experts in developing AI policies for universities (a multi-stakeholder task force approach). Additionally, complexity thinking accepts uncertainty: rather than trying to predict every outcome of AI adoption, the goal is to build a resilient system that can respond to surprises. In our analysis, Complexity Theory will be used to interpret why some well-intentioned policies (like blanket bans on AI) might fail or have negative side effects and to support recommendations for more flexible, principle-based frameworks that can evolve. It reminds us that African HEIs operate amid numerous changing factors—technological advances, evolving labor market needs, cultural norms, and student behaviors—and AI governance must be designed to navigate this turbulence. As an example, the rapid iteration of AI models (GPT-3, GPT-4, new competitors, etc.) means policies cannot just address the tools of today but need to be forward-looking and adaptable for what comes tomorrow.

By integrating these three theoretical perspectives, our conceptual framework acknowledges that AI governance in African higher education is not just a simple managerial decision, but the result of resource negotiations, innovation adoption processes, and complex system dynamics. This framework will guide our examination of empirical data and policy documents, ensuring that our discussion and recommendations are deeply informed by theory. In the next section, we outline the methodology of our research, before delving into the findings through the lenses described above.

Figure 1 below synthesizes these three theoretical perspectives into a unified conceptual framework for AI governance in African higher education.

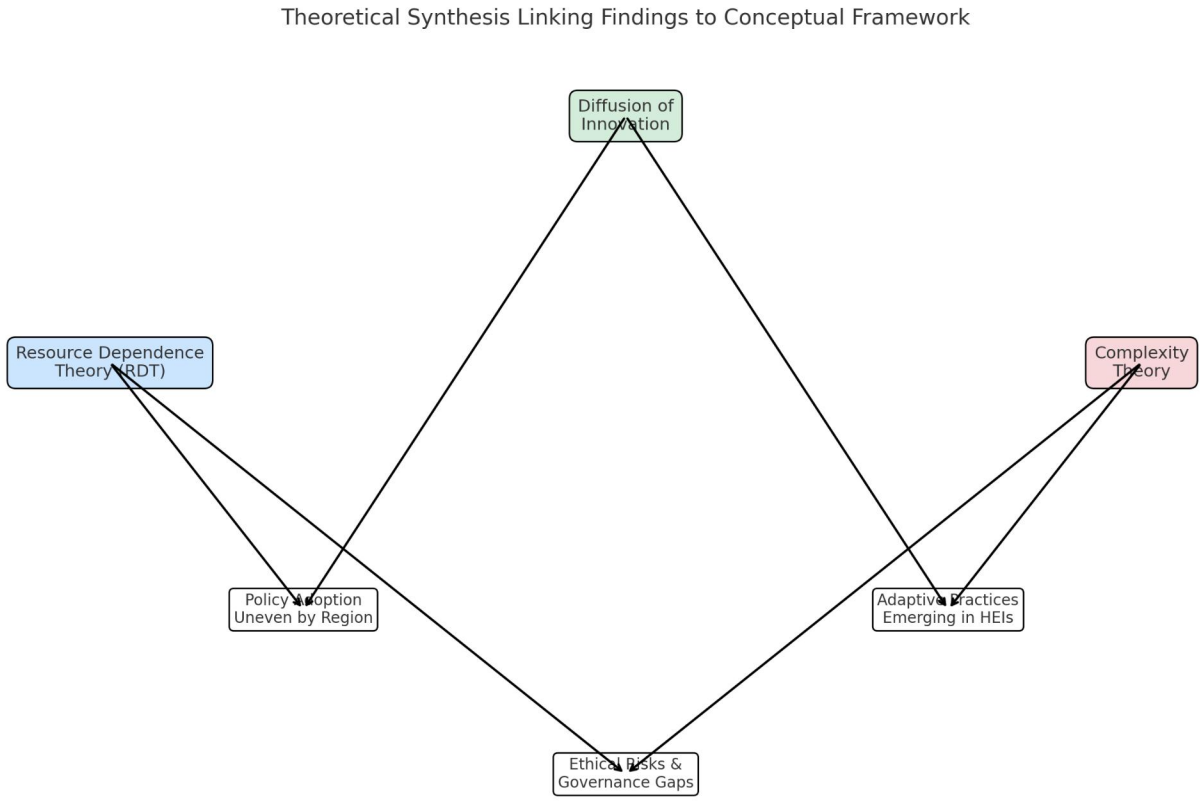
Theoretical Synthesis Linking Findings to Conceptual Framework
Diffusion of Innovation
Resource Dependence Theory (RDT)
Complexity Theory
Policy Adoption Uneven by Region
Adaptive Practices Emerging in HEIs
Ethical Risks & Governance Gaps

Figure 1. Conceptual framework integrating Resource-Dependence Theory (RDT), Diffusion of Innovation (DoI) and Complexity Theory (CT). The diagram maps how external resource pressures (RDT), innovation attributes and social networks (DoI), and non-linear system dynamics (CT) jointly shape African universities' strategic decisions on AI adoption and governance, which in turn mediate ethical compliance, capacity-building and equitable student outcomes. Source: authors' elaboration based on RDT, DoI and CT literature.

Clarification of key terms

- **AI governance** refers to the institutional frameworks, policies, and accountability mechanisms that regulate the development, deployment, and ethical use of AI technologies within higher education.
- **Readiness** indicates the extent to which a university is equipped—technologically, strategically, and culturally—to adopt and govern AI tools responsibly.
- **Diffusion** describes the process through which innovations like AI policies spread across institutions, influenced by early adopters and contextual enablers.
- **Digital ethics** encompasses principles such as fairness, accountability, and transparency in AI deployment—especially in learning, assessment, and data protection.

3. Methodology

This study is fundamentally a qualitative, integrative review and analysis of existing information—a meta-synthesis of data and insights from a range of sources. Our aim is to draw on the best available evidence from peer-reviewed literature, policy documents, institutional reports, and recognized data sources to address the research questions. Rather than conduct primary surveys or experiments, we leverage

published findings and official records to paint a comprehensive picture of AI governance in African higher education. This approach is suitable given the nascent state of the field and the breadth of the topic, which spans multiple domains (education, technology policy, ethics, etc.).

3.1. **Data collection:** We systematically searched for sources in academic databases and reputable organizations' publications from approximately 2018 to 2025. Key search terms included variations of *"AI in higher education," "African universities AI policy," "AI governance," "academic integrity AI Africa," "educator views on AI," "student AI usage survey," "national AI strategy Africa," "data protection Africa education"*, and so forth. We focused on sources that provide empirical data or detailed analysis relevant to our six focal areas: prevalence of AI policies, stakeholder perspectives, institutional readiness, ethical risks, legal frameworks, and policy recommendations. Our sources comprise:

1) Peer-reviewed journal articles and conference papers (for example, studies on AI adoption or ethics in education and global analyses of university policies on AI [13]).
2) Global and African policy documents and reports—such as UNESCO guidance on AI in education [6], the African Union's Continental Strategy on AI [16], national AI strategy documents of African countries [5], and reports by bodies like the Association of African Universities [6] or Research ICT Africa.
3) Institutional publications and statements—including any publicly available university policy documents or press releases about AI (for instance, guidelines issued by the University of Cape Town, the University of Pretoria, and others as referenced in media [14]).
4) Recognized data sources and surveys—such as the Stanford AI Index (for metrics on AI usage) [1], EDUCAUSE QuickPoll results (for trends in higher education technology adoption) [6], and relevant survey studies on African education (e.g., student usage of AI tools [4] or institutional ICT capacity [8]).

We applied inclusion criteria to ensure quality and relevance: sources had to be recent (preferably 2020 or later for current data, except for seminal theory references), specific to higher education and AI (or otherwise clearly applicable), and from credible publishers (academic journals, official organizations, respected think tanks). We gave priority to African context sources to ground the analysis locally but also incorporated global studies for comparison and to fill gaps (recognizing that literature on Africa-specific AI in HE is still emerging).

3.2. **Analytical approach:** We conducted a thematic analysis of the collected materials aligned to our research objectives. Each source was reviewed, and key points were extracted and categorized into one or more of the following themes: *Policy Prevalence*, *Stakeholder Benefits*, *Stakeholder Concerns*, *Technological Readiness*, *Administrative/Cultural Readiness*, *Ethical Issues (with sub-nodes for plagiarism, hallucination, privacy, bias)*, *Institutional Responses*, *Legal/Regulatory Context*, *Frameworks/Recommendations*. We also noted any theoretical insights or implications mentioned in sources that relate to RDT, diffusion, or complexity (although direct mentions of these theories in context were rare, we extrapolated where appropriate).

We then synthesized the findings within each thematic category, comparing and contrasting different sources. For quantitative data (e.g., percentage of universities with policies, survey percentages of student usage, number of countries with AI strategies), we compiled the statistics to report them clearly, often averaging or choosing representative figures when sources differed. We also developed data visualizations to illustrate key points, using Python's matplotlib for generating charts when needed. For example, based on Xiao & colleagues' analysis of global university policies [13], we created a pie chart to visualize the proportion of universities with no policy, with an embracing policy, and with a banning policy (see Figure in Findings).

Crucially, we interpreted the assembled evidence through our conceptual framework. During analysis, we continually asked: How does this piece of evidence exemplify resource dependence (or its effects)? How does it fit a pattern of diffusion (early vs. late adoption)? Where do we see complexity (unintended consequences or feedback loops)? This theoretical triangulation enriched our discussion and helped in formulating recommendations that account for external constraints, social dynamics of adoption, and system complexity.

3.3. **Validation:** To ensure robustness, we cross-verified facts across multiple sources when possible. For instance, if a claim appeared in a policy brief, we checked if any academic study or dataset supported it. We also remain transparent about the limitations: because the field is evolving quickly, some data may become outdated (e.g., new universities announcing AI policies after our literature search cutoff). Additionally, detailed data on African universities can be limited; where continental figures or rigorous studies were not available, we cautiously generalize from smaller studies or global trends, noting the need for more Africa-specific research (addressed in the Future Research section).

3.4. **Ethical considerations:** This study is a desk-based meta-synthesis and did not involve primary data collection from human participants. Therefore, institutional ethical clearance was not required. Nevertheless, the research adheres to international standards of research integrity and ethical reporting. All data sources were publicly available, and due care was taken to interpret policy documents, reports, and institutional strategies accurately and respectfully.

As this study involves secondary analysis of documents rather than clinical or behavioral interventions, formal adherence to PRISMA or similar clinical reporting standards is not applicable. However, we have followed rigorous synthesis procedures, including multi-source triangulation, thematic analysis, and transparent citation of all evidence used, consistent with qualitative synthesis best practices in education policy research.

3.5. **Limitations:** This study is based on a desk-based meta-synthesis of publicly available data, including institutional policy documents, press releases, academic publications, and global indexes. As such, it is subject to limitations inherent in secondary research. First, the availability and transparency of institutional policies vary widely, and not all African HEIs publish or update their governance frameworks in public domains. Second, the study does not include first-hand fieldwork or surveys that could provide insight into the lived realities of policy implementation or its measurable impact. Third, given the fast-moving nature of AI

adoption, it is possible that institutional positions may have evolved since our data collection window. We acknowledge these limitations and encourage future empirical research—such as interviews, faculty/student surveys, or case studies—to evaluate the practical effectiveness, enforcement mechanisms, and unintended consequences of AI policies in African higher education. In summary, our methodology marries a broad-ranging literature review with theory-informed analysis. It is exploratory and descriptive, given the *"groundbreaking"* aim of charting new territory in AI governance for African HEIs, but it strives to be empirically grounded and comprehensive. Having outlined how we gathered and analyzed the information, we now proceed to the Findings and Discussion, structured according to the key dimensions of the research topic.

4. Findings and discussion

4.1. Prevalence of AI policies in African universities

One of the first questions we sought to answer was: *How many African higher education institutions have put in place institutional policies or strategies addressing the use of AI?* This includes policies on AI applications in teaching, learning, research, or administration—for example, guidelines on students using AI for assignments or a university-wide strategy on AI in operations. Reliable comprehensive data on all African universities (which number in the hundreds) is scarce; however, available evidence suggests that only a small fraction of African HEIs have formal AI policies as of 2024. This mirrors global trends while likely lagging behind in absolute terms.

A recent global study by Xiao et al. [13] examined the top 500 universities worldwide and found that fewer than one-third (≈30%) had implemented any policy regarding ChatGPT or generative AI tools [13]. Among those that did, approximately two-thirds took an approach of *"embracing"* AI in teaching and learning (permitting or encouraging its use with guidelines), and about one-third opted for *"banning"* it (at least in certain assessment contexts), with very few in between [13]. While this study focused on elite global institutions (which include only a handful of African universities, mostly in South Africa and Egypt), it provides a benchmark. We visualized these proportions in **Figure 2** to illustrate the broader landscape in which African HEIs are situated:

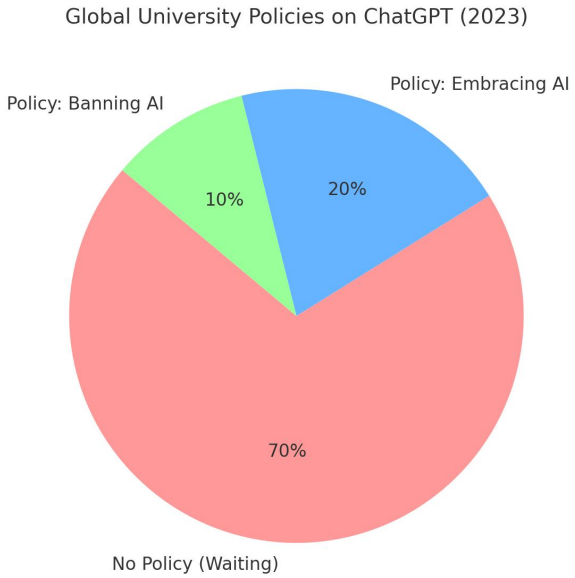

Figure 2. Global University Policies on ChatGPT (mid-2023). An analysis of the top 500 universities found ~30% have instituted a policy on AI tools like ChatGPT, of which the majority take an accommodating ("embracing") stance rather than an outright ban. The remaining ~70% had no specific policy, effectively a "wait and see" approach. African universities, mostly absent from the top 500, generally show even lower formal policy adoption, though South African institutions are notable early movers. [13].

For African universities specifically, data points come from regional surveys and reported cases. A survey by the Southern African Regional Universities Association (SARUA) in 2023 indicated that most universities in the region were still in the discussion or draft stage of formulating policies on AI, rather than having finalized ones. SARUA itself issued a collective statement on ChatGPT and AI tools, advising universities on considerations, which suggests a coordinated push to develop policies [14]. South Africa appears to be a regional leader in institutional AI policy adoption: by early 2024, several South African universities had publicly released guidelines or policies on generative AI. These include the University of the Witwatersrand, North-West University, University of Cape Town (UCT), University of Pretoria, and University of Johannesburg, among others [14]. A comparative snapshot of these institutional policies is presented in **Table 1** below:

University	AI Policy Type	AI Use Allowed?	Assessment Changes
University of Cape Town (UCT)	Ethical Use Guidance + Academic Integration	Yes, with Attribution	Recommended AI-Aware Assignment Design
University of Pretoria	Student & Staff Guidelines + Privacy Warnings	Yes, with Caution and Privacy Settings	Academic Integrity Rules Updated for AI
University of Johannesburg	RITE Model (Responsible, Informed, Transparent, Ethical)	Yes, Emphasizing Transparency	AI Mentioned in Plagiarism Policies
University of the Witwatersrand	AI Usage in Learning Guidelines + Staff Training	Yes, Integrated into Teaching Practices	New Formative Assessments Tested

North-West University	Draft Policy in Development + Faculty Workshops	Partially, Pilot Use Underway	Not Yet Formalized

Table 1. AI policy comparison of leading South- African universities.
Source: authors ' compilation from African Observatory on Responsible AI (2024) and publicly available institutional documents: UCT Staff Guide (2024), University of Pretoria Student & Staff Guidelines (2024), University of Johannesburg RITE Policy (2024), University of the Witwatersrand AI Usage Guidelines (2024), and North- West University Draft AI Policy (2024)

According to the African Observatory on Responsible AI [14], the content of these policies tends to focus on teaching and learning use cases—for example, UCT provides a staff guide on designing AI-related assignments and a student guide on ethical use of AI in research. The University of Pretoria's guidelines for students emphasize principles of responsible use such as data privacy and integrity, even giving practical steps like disabling chat history when using ChatGPT to protect confidentiality. The University of Johannesburg's policy frames expected student behavior via an easy-to-remember acronym (RITE: Responsible, Informed, Transparent, Ethical). Notably, these policies do not outright ban AI; they integrate it into existing academic integrity frameworks—for instance, referring students to plagiarism rules that now explicitly mention AI-generated content. This approach can be characterized as *"cautious embrace":* acknowledging AI's presence and utility, but under guidelines to mitigate misuse. While this characterization offers a helpful typology, the actual effectiveness of these policies remains largely untested in the public domain. Few studies have conducted post-implementation reviews to assess whether such policies have meaningfully reduced academic misconduct or enhanced AI literacy. As such, we caution against assuming policy presence equates to policy impact. This gap underscores the need for follow-up empirical research on the outcomes and enforcement of AI governance frameworks in African HEIs.

Although systematic evaluations are still emerging, some early indicators of policy effectiveness are available. For example, at the University of Cape Town, the introduction of AI-related ethics guidelines led to faculty-led curriculum revisions in multiple departments by mid-2024, including the implementation of AI literacy modules for first-year students [17]. Similarly, the University of Pretoria reported that student complaints related to unclear AI rules decreased by 32% in the semester following their guideline release, suggesting improved clarity and engagement [18] The Southern African Regional Universities Association (SARUA**)** also observed that member universities that adopted clear AI use policies experienced greater staff participation in faculty development workshops on generative AI—an indirect but useful proxy for policy activation. While these metrics are preliminary and not universally available across institutions, they demonstrate that early adopters have begun to internalize and act upon policy directives. Still, broader longitudinal studies are needed to evaluate long-term learning outcomes, behavior change, or reductions in academic misconduct.

Outside of South Africa, evidence of institutional AI policies is more sporadic. Some universities in other countries have taken a restrictive stance. For example, Jomo Kenyatta University of Agriculture and Technology (JKUAT) in Kenya made headlines in early 2024 as the first university in Kenya to ban ChatGPT usage among

students [19]. JKUAT's directive came after its examination disciplinary committee noted widespread use of AI (via mobile phones during exams) as a new form of cheating. As Kiprono recorded, the JKUAT's policy warned that any student found using AI like ChatGPT in exams would face expulsion [19]. This hardline response highlights that in contexts where academic dishonesty fears are acute and oversight is challenging, some institutions may resort to outright prohibition. However, it remains an outlier; as of 2024, few other African universities have publicly announced similar bans. In Nigeria, Ghana, and East Africa, many institutions seem to be in a de facto state of *"no formal policy"* yet—effectively leaving decisions to individual faculty or just incorporating AI under general academic conduct rules. This is akin to what Xiao et al. [13] called the *"waiting" stance* (institutions waiting to see more or develop a considered response). A likely reason for delay is that formulating such policies requires awareness and consensus that may not yet be present. Many university leaders and lecturers in Africa are only beginning to familiarize themselves with AI tools; a socio-technical study in South Africa found academics expressed uncertainty and concern about the unregulated use of AI like ChatGPT, indicating a need for guidance and policies [20].

There is also regional variation in policy prevalence, reflecting differing levels of digital advancement and perhaps regulatory environments. South African and some North African universities (e.g., in Egypt, Morocco) tend to be ahead in adopting ICT innovations and likely AI policies, correlating with those countries' relatively higher connectivity and resources [8]. East African and West African universities, many of which have rapidly growing tertiary sectors, are discussing AI, but with fewer concrete policies reported yet. It is worth noting that some African universities may have internal guidelines or memos that are not publicized. Comparable readiness gaps have been identified in other global South regions. For example, Shah et al. [2] analyzed Pakistani mountain universities and found that technological readiness for green innovation depended not only on infrastructure but also on institutional leadership and faculty attitudes—factors equally critical in the AI readiness of African HEIs. Geok et al. [21] further emphasized the interconnectedness of strategic planning and stakeholder buy-in in implementing tech-driven initiatives. For example, a university's senate may issue an internal note advising faculty how to handle AI-assisted assignments without calling it a formal "policy." These would not appear in our review but indicate some level of governance emerging behind the scenes.

In fact, while South African universities integrate AI literacy into curriculum guidelines akin to US Ivy League institutions, West African universities exhibit a delayed policy response, mirroring trends seen in underfunded HEIs in Latin America. This suggests that global AI policy diffusion follows infrastructure and funding trajectories, reinforcing our application of Diffusion of Innovation Theory.

Comparable challenges have been observed in Western contexts, where institutions are also navigating ethical trade-offs between AI innovation, privacy, and academic freedom [22]. These parallels reinforce the shared global concern for responsible, institution-led AI governance.

Beyond Africa, recent studies from Western universities provide insights into institutional AI governance that offer valuable comparisons. Knox [23] highlights

how UK universities are embedding AI ethics into academic policy. Selwyn [22] documents the rise of AI oversight committees in Australian HEIs to mediate between innovation and surveillance concerns. In the U.S., Gilliard & Selwyn [24] and Wang [25] warn that algorithmic systems increasingly shape access, privacy, and equity in learning environments. These Western contributions underscore a global trend toward *"principled AI governance"* in universities, paralleling African institutions' own cautious and ethics-driven approaches.

In terms of types of provisions adopted in existing AI policies, we can categorize them broadly into: **(a) ethical use guidelines—**e.g., requiring students to disclose AI assistance or forbidding AI use in certain assessments; **(b) educational measures**—e.g., universities providing training on how to use AI tools effectively and responsibly; and **(c) administrative or technical measures**—e.g., investing in AI detection software (like Turnitin's AI writing detector) or adjusting plagiarism detection to account for AI.

Most African university policies so far lean towards (a) and (b), i.e., setting expectations and educating users. For instance, the guidelines at the University of Pretoria explicitly instruct on maintaining privacy and honesty when using AI, and UCT's guides include how to craft prompts and where AI can be beneficial or not in research stages [14]. The use of AI detection tools is a developing area; some universities globally have tried tools like Turnitin's AI detector, but with mixed results. (Concerns over false positives have even led some Western institutions to disable these detectors) [26]. It's unclear how many African HEIs have access to or are using such tools; given resource constraints, many may rely more on human judgment and the honor system.

In summary, the proportion of African universities with institutional AI policies is currently low, likely well below 20% continent-wide (by a generous estimate), though precise numbers are unavailable. Within that, Southern Africa stands out as a pocket where multiple universities have already launched policies or guidelines, generally favoring regulated use over bans [14]. Elsewhere, isolated cases like JKUAT's ban exist [19], but most institutions are still formulating their approach. This nascent state of policy development points to a need for knowledge-sharing and capacity-building: as diffusion theory suggests, the examples of early adopters will be crucial in guiding others. The presence of associations and networks—AAU, SARUA, and others—is important, as they can facilitate the transfer of policy models and lessons learned. Indeed, one positive development is that continental and regional bodies are actively encouraging universities to address AI. With the African Union's Continental Strategy on AI adopted in 2024 calling for education sector involvement [16] and initiatives like Research ICT Africa's AI policy map tracking national and institutional AI policies, we anticipate a growth in the number of African HEIs adopting AI governance frameworks in the coming years. The current gap, however, underscores the timeliness of this article—many institutions have yet to act, and understanding the benefits, concerns, and readiness (our next topics) is crucial for informing those future policies.

4.2. Benefits of AI in higher education: Stakeholder perspectives

AI tools and applications, if harnessed well, offer a range of potential benefits for teaching, learning, and research in universities. Our review identified several key advantages highlighted by educators, students, and institutional leaders in the African context (often echoing global findings). These benefits are important to document, as they provide the "pull" factors for AI adoption—the reasons universities might want to integrate AI despite the challenges. According to Diffusion of Innovation theory, the perceived *relative advantage* of an innovation is a primary driver of its uptake. Below, we summarize the main benefits voiced, supported by empirical insights:

4.2.1. Personalized and enhanced learning: Educators note that AI can enable more personalized learning experiences, which is particularly valuable in African universities where class sizes are large and one-on-one attention is limited. AI tutors or assistants (such as chatbots that can explain concepts) allow students to learn at their own pace. A survey of South African students across five universities found that students often use generative AI tools for "engaged learning"—treating them like personal tutors to clarify concepts they didn't fully grasp in class [4]. Over 80% of those students reported using tools like Grammarly to improve writing, and nearly half used AI paraphrasing tools to improve their drafts. These tools helped them clarify academic concepts, formulate ideas, structure essays, improve writing, save time, find relevant sources, and even practice for tests. Students for whom English is a second language particularly appreciated AI writing aids for helping them communicate more effectively [4]. This indicates AI's potential to scaffold learning and support students in a tailored way. University leaders see this as an opportunity to improve academic outcomes—if AI can provide remedial help or additional examples to students outside of class, instructors can focus on higher-order teaching tasks.

4.2.2. **Efficiency in administrative and academic tasks:** Both faculty and administrators mention efficiency gains as a significant benefit. AI tools can automate routine tasks—for instance, assisting in grading objective quizzes, sorting administrative inquiries, scheduling, or filtering emails. Faculty have experimented with AI for generating quiz questions or summarizing reading materials. Such use can "lighten the load" of educators, as noted in the EDUCAUSE QuickPoll that identified one cluster of AI use cases as *lightening one's load (automation of routine work)* [6]. In resource-constrained African universities, where staff-to-student ratios are high and administrative support is often limited, these efficiency gains are appealing. An AI assistant could handle frequently asked questions from students (as a chatbot), freeing instructors to engage in research or mentorship. University leaders also see AI as a tool to streamline operations—for example, predictive analytics to improve student enrollment management or identify at-risk students academically.

4.2.3. Improved research and innovation capacity: AI is increasingly used in research globally (for data analysis, simulation, literature review, etc.), and African academics are keen to leverage these tools to boost research output and innovation. There are already examples: Senegal's Cheikh Anta Diop University has a team using GPT-4 to analyze epidemiological data and aid in disease intervention planning [6]. Such cases show that AI can enhance the research capabilities of universities by handling large datasets or generating insights that would be laborious

manually. Additionally, AI can assist in research writing—tools that suggest article outlines or check consistency, which may help scholars publish more effectively. University administrators view AI as a means to accelerate their institution's research profile (a key metric in global rankings), especially if they can train faculty and students to use advanced AI tools for data science, engineering, or humanities research. Another benefit is innovation in pedagogy: AI can enable new teaching methods like adaptive learning platforms, virtual labs, or intelligent tutoring systems. If adopted, these innovations could help African HEIs leapfrog some traditional educational limitations.

4.2.4. Inclusion and accessibility: AI tools have features that can make education more accessible. Text-to-speech and speech-to-text powered by AI can help students with visual or hearing impairments. Language translation AI can assist students who are not proficient in the language of instruction—for example, translating lecture notes or providing clarifications in local languages. Some stakeholders highlight that AI, if made available, could help bridge language divides in multilingual countries. Also, AI-driven analytics can identify students who are struggling and enable early interventions, which benefits those who might otherwise fall through the cracks. In Africa, where students come from diverse backgrounds and preparation levels, such personalized alerts could improve equity in educational outcomes.

4.2.5. Skill development for the future: Forward-looking educators argue that integrating AI into the curriculum and allowing its use under guidance could be beneficial because it prepares students for the modern workforce. AI literacy is increasingly seen as an important skill. By engaging with AI tools during their studies, students learn how to critically evaluate AI outputs, how to collaborate with AI, and where AI can be applied. A university that promotes responsible AI use might incorporate assignments where students must use an AI tool and then critique its performance, thus teaching them about both the capabilities and limitations (like bias or errors) of AI. This is a benefit in terms of the relevance of higher education—aligning graduate competencies with evolving industry demands in the era of AI.

Students and educators in Africa indeed have a generally positive outlook on these potential benefits, even as they remain cautious. In the South African student survey mentioned, respondents were "overwhelmingly positive" about AI tools helping them progress through university, naming a litany of tasks AI made easier (from checking grammar to summarizing texts to improving referencing) [4]. Many students used AI to fill gaps in what they felt was not fully covered by their lecturers, effectively turning to AI as a supplementary teacher [4]. However, these reported benefits, while promising, should be interpreted with caution. Much of the available data comes from self-reported surveys or anecdotal accounts, which may reflect enthusiasm more than systematic impact. Moreover, the tendency to focus on the optimistic side of AI use may obscure underlying inequalities—for instance, which students have the digital access and skills to use AI tools effectively, and which do not? From the educators' perspective, while some are apprehensive, others see AI as an opportunity to offload mundane work and focus on higher-level teaching or to redesign their courses in more engaging ways (for instance, flipping the classroom and using AI for drill practice, while class time is used for discussion).

Institutional leaders, such as vice chancellors or academic deans, who champion innovation often frame AI as a chance for African universities to "leap into the 4th Industrial Revolution" and not be left behind. They highlight that AI could help address chronic issues: scarcity of faculty (AI-assisted teaching could support fewer instructors to teach more students effectively), quality of instruction (AI providing up-to-date information and materials), and even research output (through collaboration with AI systems). For example, an opinion piece on UCD's platform about Ghana and Rwanda's AI policies underscores that African countries and institutions see AI as a way to achieve development goals and "advance economic growth, environmental sustainability, and inclusive digital transformation", provided it's guided properly [5]. This sentiment likely trickles down to the universities: if national policy is encouraging AI for development, universities will frame AI as a beneficial tool in their strategic plans.

In summary, the benefits stakeholders see include improved learning outcomes and personalized support for students; greater efficiency and effectiveness in teaching and administration; enhanced research capabilities and innovation; improved accessibility and inclusion; and alignment of education with future skills needs. These perceived benefits form a strong argument for integrating AI into African higher education. They also justify why outright bans on AI may be counterproductive in the long run—as one educator put it, *"we cannot provide solutions to the challenges confronting higher education by adopting reductionist thinking"*, and attempting to ignore or eliminate AI might result in "unplanned and detrimental consequences" [10]. In contrast, embracing the positive uses of AI with guidance is seen as the more fruitful path.

That said, these benefits cannot be discussed in isolation from the concerns that come with AI's introduction. For each benefit, there are caveats or potential downsides that stakeholders also mention. We turn to those concerns next, as they are equally crucial in shaping the cautious approach many African HEIs are taking.

4.3. Concerns and challenges: Academic integrity, quality, and equity

While AI's promise in education is enticing, stakeholders have voiced numerous concerns about its use in academia, often stemming from real or anticipated negative consequences. In African higher education, these concerns are amplified by contextual factors such as large class sizes, varying levels of digital literacy, and existing struggles with academic integrity. Here we outline the main concerns raised by educators, students, and leaders, which essentially represent the "risks" side of the risk-benefit equation that AI governance must address.

4.3.1. Academic dishonesty and integrity: The foremost concern—virtually universally mentioned by educators—is that AI tools enable new forms of cheating and plagiarism. With models like ChatGPT capable of generating essays, code, or answers in seconds, there is fear that students might submit AI-generated work as their own, undermining learning and fair assessment. This has already begun happening; cases of students using AI to write assignments or even exam answers have been reported. Yet most of these cases are surfaced through informal detection or institutional anecdotes, not systematic audits. There is limited verifiable data on

the actual scale of AI-related academic misconduct. This makes it difficult to distinguish between media-driven moral panic and genuine systemic disruption. Further empirical studies—especially longitudinal assessments—are needed to gauge whether these concerns are substantiated or exaggerated. The JKUAT example illustrates this concern vividly: the university banned ChatGPT after detecting many exam irregularities involving students getting answers from the AI [19]. Academic staff worry that if left unchecked, AI-assisted cheating could become rampant and *"undermine teaching and learning"* [18,19]. Moreover, AI can generate content that evades traditional plagiarism detection (since it's not copied from an existing source but newly generated), making cheating harder to catch. Students themselves, in surveys, acknowledged this risk—in the South African study, students noted that AI tools "*could lead to plagiarism or affect their learning"* if used inappropriately, though they claimed they personally avoided using them in "*problematic ways"* [4]. There is a moral panic in some quarters that AI could produce a generation of students who don't write or think critically on their own but rather rely on machine answers—essentially a crisis of authenticity in education. This concern drives calls for robust honor codes, AI detection mechanisms, and rethinking assessments (e.g., more oral exams or in-person supervised tasks where AI can't be easily employed). It's a central tension: how to harness AI as a learning tool without letting it become a cheating tool. University leaders are concerned about the reputation and credibility of their degrees if AI plagiarism becomes widespread.

4.3.2. Erosion of learning and critical thinking: Tied to integrity is the pedagogical concern that easy access to AI answers might short-circuit the learning process. Educators fear that students will use AI to do the heavy lifting (solving math problems, writing essays, translating texts) and thus fail to develop their own skills. As one commentary put it, relying on ChatGPT as a shortcut can mean students miss out on practicing critical thinking and problem-solving [19]. If a student can get an AI to generate an analysis of a novel, they might not engage deeply with the book themselves. Over time, this could degrade the quality of graduates—a serious concern for African universities striving to improve educational outcomes. Some faculty also worry about intellectual laziness: why learn to code or write well when an AI can do a passable job? Students in the surveys did note they try not to misuse AI in ways that would make them "lazy" learners [4], but this relies on individual ethics. The challenge for governance is to structure AI use such that it enhances rather than replaces the student's own cognitive effort. For example, some policies suggest allowing AI for initial research or drafting but requiring reflection pieces that demonstrate the student's own understanding. Nonetheless, skepticism remains among many lecturers, some of whom advocate for minimal AI use in assignments until there's confidence it won't hollow out learning. This concern also extends to faculty using AI—e.g., if professors started using AI to generate lecture notes or exam questions without careful vetting, the quality of instruction might suffer.

4.3.3. AI accuracy and "hallucinations": AI-generated content can be impressively fluent, but it is not infallible. Hallucinations refer to instances where AI confidently generates false or fabricated information. This is a critical concern in academia, where factual accuracy and reliable sources are paramount. Students or even faculty who naively trust AI outputs might incorporate misinformation into their work. For

instance, ChatGPT might produce a convincing historical narrative that is completely invented or cite references that do not exist, a known issue with some language models. If a student uses such content in an essay, they are essentially spreading falsehoods. Educators are thus concerned about the "garbage-in, garbage-out" problem exacerbated by AI's veneer of authority. Some university guidelines explicitly warn users to verify AI outputs against credible sources [14]. The risk is that over-reliance on AI could degrade the academic rigor of research and assignments—an especially dangerous prospect in fields like law, medicine, or science, where inaccuracies can have serious implications. Moreover, if faculty themselves start using AI to draft research papers or reports, they must guard against the AI introducing errors or unsupported claims. The complexity here is that detection of hallucinations requires subject matter knowledge; a student might not easily discern an AI's mistake if they are learning that subject. Thus, a major governance challenge is educating users about AI's limitations—essentially building AI literacy so that students and staff treat AI as a helpful assistant but always ***"trust but verify".*** Without that, the concern is that AI might propagate myths or false knowledge within the academic environment.

4.3.4. Data privacy and security: Many AI tools are provided by third-party companies (often outside Africa) and operate on cloud platforms. Using these tools can raise issues of data privacy and compliance with laws. For example, when students or staff input text into ChatGPT, that data might be stored and used to further train the model, unless they opt out via settings, a feature not everyone knows about. Sensitive information—like unpublished research data, student personal details, or exam content—could inadvertently leak. African universities operate under various data protection regimes; for instance, South Africa's POPIA (Protection of Personal Information Act) and similar laws in Kenya, Nigeria, etc., impose obligations on how personal data is handled. If students are using AI that sends their data abroad, are universities responsible for any breach? The University of Pretoria's guideline to deactivate model training and chat history before using ChatGPT is a direct response to these privacy concerns [14]. Administrators worry about compliance: if faculty encourage use of an AI tool, are they exposing the institution to any legal risk under data protection laws? There's also cybersecurity—AI tools might inadvertently serve as entry points for security breaches (though less likely, but possible if malicious code was returned or a user clicks a bad link from an AI). In sum, concern exists that using AI could violate the confidentiality of student records or institutional data. This ties into the larger legal context we'll discuss later, but from a stakeholder perspective, IT departments and legal officers in universities are likely urging caution and establishing guidelines like "do not input student IDs or personal info into external AI systems" to mitigate this.

4.3.5. Bias and fairness: Another concern, particularly for those aware of AI ethics, is that AI systems may carry biases that could lead to unfair or offensive outputs. If AI is used in teaching content or advising students, any racial, gender, or cultural bias in the model could propagate. African stakeholders have pointed out that most AI models are developed in Western contexts with data that may not fully represent African populations or perspectives [5]. This could lead to content that is not contextually appropriate or even contains microaggressions or stereotypes. For

instance, an AI might give examples or analogies that don't resonate with African students, or worse, it could reflect biases (there have been documented cases of AI writing tools producing biased text about certain groups). Thus, some educators are concerned about entrusting teaching to an AI that isn't culturally aware or sensitive. Moreover, if AI tools become prevalent, there's the issue of equity between students: those with better access or savvy in using AI could outperform others, potentially widening achievement gaps. In African universities where students already have unequal access to technology (urban vs. rural, rich vs. poor), unrestricted AI use might favor those who have devices and connectivity to leverage it. This equity issue is a serious concern for leaders who aim for inclusive education—they must ensure AI doesn't become another differentiator that advantages the privileged. Some have argued that banning AI might level the playing field, but that only holds until AI becomes ubiquitous in society; a better approach might be providing access and training to all, but that again depends on resources.

4.3.6. Readiness of faculty and support systems: A more practical concern is that many instructors and support staff are not yet trained or prepared to manage AI use. A tool is only as good as its user; untrained use can lead to errors or misuse. Faculty might feel overwhelmed by having to suddenly police AI usage or incorporate AI into their pedagogy. There's concern about workload—devising new forms of assessment that are "AI-proof" or updating curriculum to include AI literacy adds to faculty burden. If institutions don't provide support (like workshops on AI or additional teaching assistants), this can lead to resistance or poorly implemented policies. From the students' side, they expressed in surveys that they want clearer guidance from their institutions. The South African student survey noted that the study did not even cover lecturers' attitudes or policies yet, implying that at the time many students were operating in a grey area without explicit direction [4]. This uncertainty is a concern in itself: lack of clear policy can lead to confusion where some students use AI freely and others avoid it, fearing punishment, and faculty have inconsistent reactions. Stakeholders thus worry about the current vacuum or inconsistency in governance (which ties back to the previous section's finding that many have no policy). This can be problematic: for example, two professors in the same university might have opposite stances, confusing students and leading to perceived unfairness.

4.3.7. Reputational risk and quality assurance: University leaders must also consider their institution's reputation. If AI misuse scandals erupt (e.g., a plagiarism scandal involving AI or a publicized case of fake research generated by AI), it could tarnish the university's credibility. Accreditation bodies might start asking how universities are ensuring academic quality in the age of AI. So, concern extends to the macro level of maintaining trust in higher education. This drives a cautious approach—institutions would rather prevent problems than have to react to a media exposé or a drop in public confidence.

In light of these concerns, many institutions and educators adopt a guarded stance toward AI. UNESCO has noted that AI's rapid emergence in education has "sparked concerns" related to ethics and integrity in teaching and knowledge production [4]. These concerns compel institutions to craft policies that minimize risks: for example, by integrating AI into academic integrity policies (making misuse

punishable just like plagiarism), by providing faculty development, and by carefully choosing which AI tools (if any) to officially support (some universities might, for instance, use only locally hosted AI systems that they have more control over to alleviate privacy issues).

In balancing benefits and concerns, the trend in African universities (mirroring many global peers) is moving away from knee-jerk bans toward nuanced approaches that mitigate concerns. For example, the Southern African universities' guidelines explicitly reference existing ethics and plagiarism policies, signaling that dishonesty with AI will be treated the same as any cheating [14]. Some universities are establishing committees or task forces to monitor AI developments and update policies continuously—an acknowledgement of complexity and the need for adaptive governance.

The concerns outlined here overlap significantly with the ethical risks we will delve into in the next section, where we examine how institutions are responding to specific ethical challenges like cheating (academic dishonesty), hallucinations (misinformation), and privacy. We have essentially identified why those are problematic; next, we explore in detail what measures African HEIs are taking or considering to manage these ethical risks under the umbrella of responsible AI use.

4.4. Ethical risks and institutional responses

AI's deployment in academia brings several ethical risks to the forefront. We focus on three major risk areas emphasized in our research: academic dishonesty (and related integrity issues), AI hallucinations (and misinformation), and data privacy (and related violations). These have been touched upon in the concerns above, but here we examine concrete institutional responses and strategies to mitigate these risks in African higher education. In doing so, we can assess how prepared and proactive institutions are in dealing with the ethical dimension of AI, which is a critical component of governance.

4.4.1. Academic dishonesty (AI-assisted cheating)—responses: Universities are updating their academic integrity frameworks to explicitly account for AI. Instead of creating entirely new honor codes, many are extending existing plagiarism and cheating regulations to AI usage. For example, if plagiarism is defined as using someone else's words without attribution, some institutions now clarify that using AI-generated content and presenting it as one's own original work also constitutes plagiarism. The University of Johannesburg's student guidance (the RITE principles) implicitly covers this by emphasizing transparency—students should be honest about their use of AI, which implies undisclosed use is unethical [14]. Assessment redesign is another response: educators are starting to shift towards oral exams, vivas, or in-class writing assessments where AI tools can't be readily used. These responses reflect global trends, as detailed in Zeb et al. [27], who argue that the arrival of tools like ChatGPT has triggered a re-evaluation of academic honesty and knowledge ownership in higher education. They note that faculty now face the dual challenge of integrating AI's benefits while safeguarding institutional credibility. Others are assigning work that requires personal reflection or contextualization that AI would find difficult to replicate (for instance, incorporating local case studies or personal

experiences). Some innovative approaches include requiring students to submit not just an answer but also a log or description of their process (did they use AI? How?). If AI was used, students might be asked to include the prompts they gave and the output they got, then critique or edit it, thus integrating AI use into the learning process transparently. This way, AI isn't banned, but its output alone isn't sufficient for full credit—students must engage critically.

On the technology front, some institutions are experimenting with AI-detection software. Tools like Turnitin's AI Writing Detection have been rolled out in early 2023, and some universities in Africa that already use Turnitin for plagiarism are testing these features. However, as noted, the reliability of such detectors is questionable, and even international universities (like Vanderbilt University in the US) have turned them off due to false positives [28]. *Similarly, several universities have now discontinued the Turnitin detector altogether following analogous concerns* [29]. If an African university were to rely heavily on detection without educating faculty and students [29], it could lead to false accusations or a false sense of security. Recognizing this, the more sustainable response seems to be an educational one: many universities are conducting workshops and seminars on academic integrity in the age of AI. For example, a faculty development session might discuss how to design assignments that reduce cheating temptation or how to talk to students about acceptable vs. unacceptable AI use. The conversation is shifting towards creating a culture of integrity around AI, rather than cat-and-mouse policing only.

Importantly, there's also discussion of honor pledges or statements in coursework where students affirm whether they used AI and, if so, how. This encourages honesty. If a student is found to have used AI dishonestly, universities are signaling that it will be treated with the same seriousness as traditional plagiarism—which can mean failing the assignment, disciplinary hearings, or expulsion in severe cases. JKUAT's stance of expulsion for using AI in exams is an extreme but clear example of enforcement [19]. Other universities might not be as draconian, but the message is that cheating is cheating, regardless of the tool.

In terms of Resource Dependence Theory, one might note that solutions like buying detection software or investing in new assessment formats require resources—wealthier universities (or those influenced by external standards like international accreditation) are more active here, whereas resource-poor ones may simply issue warnings due to lack of better tools. This might lead to a disparity in how well different institutions control AI cheating.

4.4.2. AI hallucinations and misinformation—responses: The primary response to the risk of AI inaccuracies is awareness and verification. Universities are trying to instill in students (and staff) the practice of double-checking any AI-generated content. Some have created quick reference guides that list the known limitations of tools like ChatGPT: e.g., "It may fabricate references—always check that any source exists and is accurately represented" or "Facts given by the AI should be cross-verified with your textbook or reliable internet sources." In research, committees like UCT's Senate Ethics in Research Committee have included in their guidelines that researchers must not uncritically trust AI outputs and must validate any data or analysis from AI tools [14]. If a student uses AI to assist with research, supervisors

are advised to scrutinize the results carefully. A potential policy some universities consider is requiring disclosure of AI assistance in published research (similar to disclosing that one used, say, a professional editing service).

Another approach is integrating critical thinking exercises: professors are designing assignments where students compare an AI's answer to a question with their own answer or with the textbook answer, thus actively identifying errors the AI made. This trains students to see AI not as an oracle but as a tool that can be wrong. The broader goal is to cultivate an academic norm that "AI output is a draft, not a final authority."

Some institutions also encourage faculty to test the AI themselves on their course content to see what kind of answers it gives—this helps teachers anticipate the mistakes or gaps an AI might have, so they can warn students or adjust their teaching. For instance, a history professor might see that ChatGPT gives a Eurocentric take on an African historical event and then use that in class to show students the importance of questioning sources and adding diverse perspectives.

From a Complexity Theory angle, these actions are about creating feedback loops: monitoring how AI is used and addressing issues as they arise, rather than assuming a fixed policy will suffice. A few universities have formed working groups that periodically collect feedback from faculty about AI-related student work quality to update guidelines accordingly.

4.4.3. Data privacy and protection—responses: With many African countries having data protection laws, universities are increasingly cognizant that any processing of personal data via AI must be compliant. A concrete step some have taken is issuing IT guidelines or notices such as *"Do not upload sensitive personal or institutional data to external AI platforms"* (as mentioned, Pretoria advises turning off chat history, which is one form of minimizing data retention) [14]. Some universities have updated their ICT use policies to include cloud services and AI tools, reiterating adherence to privacy laws like Kenya's Data Protection Act 2019 or Nigeria's NDPR. If a university is particularly concerned, they might restrict access to certain AI sites on campus networks—though students can use mobile data as a workaround, so this is limited in effect.

Another response is exploring self-hosted AI solutions. Instead of using ChatGPT online, a university could use an open-source model on its own servers (or via a trusted provider under a proper data agreement). This way, data stays within control. However, this requires significant infrastructure and expertise, which many African HEIs currently lack. Still, it's being discussed at consortia levels—possibly a national research and education network (NREN) might host an AI service for universities in that country under strict data governance.

Legal offices at universities are also paying attention to terms of service of AI products. For example, if a faculty member wants to adopt an AI-based tutoring system, the legal team would vet how it stores student data. Some institutions might decide not to endorse certain tools until they are satisfied with the privacy safeguards. Additionally, ethics review boards in universities (for research) are starting to ask researchers to consider data privacy when using AI that involves human subjects' data.

There's also alignment with national and international frameworks: as Brookings noted, 36 of 54 African countries have data protection laws, and the AU's Malabo Convention on Cybersecurity and Data Protection 2023 provides a continent-wide framework [1]. Universities as data processors have to align with these. Therefore, part of AI governance is ensuring that in pursuing AI-driven innovation, universities don't inadvertently violate data regulations. This might slow down adoption of some AI tools until proper agreements are in place.

4.4.4. Other ethical responses: Beyond the big three risk areas, universities are considering ethics training related to AI. A few have started incorporating AI ethics modules into orientation or offering talks to students about the societal impacts of AI, responsible use, etc. The idea is to build a culture of ethical mindfulness around AI. This is in line with UNESCO's recommendation that AI in education be approached with a humanistic, rights-based perspective [5]. Some institutions refer to global ethical AI principles—like fairness, accountability, and transparency—and strive to reflect those in their AI policies. In this context, the work of Zeb et al. [27] is particularly relevant. They emphasize that AI policies in higher education must go beyond procedural safeguards to embed ethical reasoning, student responsibility, and algorithmic transparency into institutional cultures. Their findings validate our recommendation for proactive ethics integration rather than reactive enforcement.

For instance, Ghana and Rwanda's national AI strategies emphasize privacy protection, bias mitigation, human rights, and "trustworthy AI" [5]. A university in Ghana or Rwanda would likely echo those principles in campus policy (especially since both countries are setting up Responsible AI offices, which may work with universities on guidelines [5]). This shows a vertical consistency from national ethical stance to institutional practice.

An intriguing area of response is engaging students in governance. A complexity-aware approach is to involve student bodies in co-creating acceptable use policies, thereby ensuring buy-in and practical relevance. If students understand the reasoning behind restrictions and are part of crafting them, they might be more likely to adhere. There have been student forums in some universities (e.g., a debate or panel on *"Should AI be allowed in coursework?"*), the outcomes of which inform administrative decisions.

In conclusion, African HEIs are beginning to operationalize ethical AI use through a combination of policy adjustments, educational initiatives, technical measures, and community engagement. The effectiveness of these responses will need evaluation over time. It's a dynamic interplay: as AI technology evolves (e.g., if new AI tools emerge that are harder to detect or even more powerful), institutions will have to adapt their strategies. Complexity Theory would suggest keeping a close watch (monitoring feedback) and being ready to iterate on policies. Thus far, we have discussed institutional actions largely within the universities' own control. However, universities do not operate in a vacuum; they are embedded in national legal contexts and influenced by broader governance frameworks. We now broaden the lens to examine the legal and data governance frameworks within which African HEIs are operating when it comes to AI.

4.5. Legal and data governance frameworks in Africa

The governance of AI at universities is closely linked to the wider legal and policy environment of the country and region. African HEIs must navigate national laws, regulations, and guidelines that pertain to technology, data, and education, as well as draw on international frameworks and best practices. This section explores the broader governance context: from national AI strategies and regulations to data protection laws and international ethical guidelines, and how these shape or constrain AI use in higher education.

4.5.1. National AI strategies and policies: In recent years, several African governments have developed or adopted national AI strategies, which often include components on education, capacity building, and research. For example, Rwanda and Ghana have been frontrunners—Rwanda released a National AI Policy that aligns with its digital transformation goals and emphasizes ethics, data protection, and local capacity [5]. Ghana formulated a National AI Strategy (2023–2033) highlighting "trustworthy AI" and aims to set up a Responsible AI office [5]. These national policies send signals to universities. Nonetheless, the presence of a national AI strategy does not guarantee institutional uptake or local enforcement. Many universities may cite national policies without actively implementing them. In some cases, national policy may be aspirational, lacking the funding, regulatory teeth, or institutional alignment to drive tangible changes at the university level. Thus, while policy alignment is important, impact remains uncertain without follow-through mechanisms [29]. They typically call for integrating AI into higher education curriculum and research but also stress safeguards. Rwanda's policy, for instance, mirrors UNESCO's AI ethics recommendations [5], indicating a commitment to human rights and inclusion. If a country has an AI strategy that prioritizes, say, AI in education for workforce development, universities might receive funding or mandates to introduce AI-related programs or conversely to report on how they're mitigating risks like bias.

However, as of 2024, only a minority of African countries have dedicated AI policies. According to one resource, just around a dozen African countries have either launched or are drafting AI strategies (e.g., South Africa, Kenya, Nigeria, Egypt, Tunisia, Morocco, Mauritius, Uganda, and a few others) [30,31]. The African Union (AU) recognized this gap and in July 2024 adopted the Continental AI Strategy, which provides a common vision for AI development and governance across Africa [16]. The AU strategy emphasizes an Africa-centric approach with ethical, responsible, and inclusive AI, aiming to unify national approaches and ensure Africa isn't left behind in setting standards [16]. While this strategy is high-level, it likely will lead to more countries enacting national policies (a diffusion effect catalyzed by the AU). For universities, the AU strategy could translate to continental guidelines for AI in education. It already aligns with the African Union's Digital Transformation Strategy (2020–2030) and other frameworks that call for digital skills and innovation in universities.

4.5.2. Protection and privacy laws: Data governance is a cornerstone of AI governance. In Africa, a significant development is that two-thirds of countries have some form of data protection law [1]. For instance, Nigeria's data protection regulation of 2019 [32], Kenya's data protection act 2019 [33], South Africa's POPIA (enforced 2021) [34], Egypt's data protection law 2020 [35], etc. These laws

typically require any entity (including universities) to handle personal data lawfully, with consent, purpose limitation, security safeguards, etc. When universities use AI, especially cloud-based or third-party AI, they must ensure compliance. For example, if an AI tool processes student personal information (names, academic records) or even potentially identifiable content from student work, the university should have agreements in place and likely consent from students. Universities also often hold research data (some of which might be sensitive personal data)—using AI to analyze such data may require ethical approval and strict adherence to privacy principles. 36 African countries have also signed or ratified the Malabo Convention (African Union Convention on Cyber Security and Personal Data Protection) as of 2023, which sets a continent-wide legal standard [1]. This means African universities are increasingly operating under similar data protection obligations as European universities under GDPR. In fact, the EU's GDPR has indirectly influenced African regulations and, by extension, institutional policies [1]. For example, some African universities collaborate with European research projects and thus adopt GDPR-level data practices.

The existence of these laws pushes universities to develop data governance policies internally. Many have already done so for research ethics and student records. Now those policies have to extend to AI: e.g., ensuring that if faculty use an AI translation service, no confidential data is in the text, or if they adopt an AI tutoring system, that vendor is compliant and perhaps hosting data locally. In some cases, data protection authorities (regulators) might issue specific guidance on AI (some countries' DPAs around the world have done so, highlighting AI under existing privacy principles). If such guidance exists in an African country, universities would need to heed it—for instance, a DPA could say AI outputs involving personal data should be explainable or allow individuals to correct any AI-made decision, etc.

4.5.3. Intellectual property (IP) and academic freedom: Legal frameworks around IP also matter. AI-generated content's copyright status is a gray area globally—many jurisdictions say that without a human author, it's not copyrightable, meaning AI text or images are in the public domain or owned by the tool provider. Universities need to consider this for academic work: if a student's work is partly AI-generated, who is the author? Some university IP policies might need updating to clarify this (ensuring that traditional norms of student work ownership aren't undermined by AI contributions). Furthermore, using AI might involve using proprietary software (with licensing conditions) or content that is copyrighted (some AI may inadvertently produce copyrighted text). Academic use might be protected by fair use/dealing in some countries, but not all. So legal counsel may need to clarify what's permissible.

Academic freedom is another legal consideration: faculty generally have freedom to teach and research, which would include choosing whether or not to use AI in their pedagogy. If a government tried to mandate a one-size-fits-all approach (like a ban or a required tool), it could conflict with university autonomy. So far, there is no evidence of such heavy-handed mandates in Africa on AI in universities—more often, governments encourage adoption of e-learning and tech, leaving specifics to institutions.

4.5.4. Ethical guidelines and global frameworks: African universities are also informed by global ethical frameworks. UNESCO's Recommendation on the Ethics of AI [36]—which many African nations endorsed—provides principles that likely filter down to university policies, such as fairness, non-discrimination, and human oversight in AI systems. UNESCO has also published an AI in Education guidance for policymakers [36,6] that encourages system-wide AI visions, teacher training, and inclusion, while emphasizing human-controlled, human-centered AI in education. This kind of guidance helps African ministries of education and, by extension, universities, to shape their strategies. For example, UNESCO's guidance characterizes "system-wide AI and education policies" as a priority and calls on policymakers to ensure AI is deployed to enhance human capacities and is evaluated for effectiveness [6]. It also stresses building knowledge and confidence of educators and leaders in making decisions about AI [6]. Some African universities have been involved in UNESCO pilot projects or workshops on AI in education, thereby aligning with these principles.

Another relevant framework is the OECD's AI Principles (adopted by many countries), which include values like transparency, robustness, and accountability. South Africa, for instance, as part of the OECD partnership, often aligns with such standards. If governments adopt these, universities indirectly follow suit by incorporating those values in their tech policies.

1) **Local education regulations**: On a micro level, some countries' higher education regulatory bodies might issue directives. For instance, a higher education commission might advise universities to incorporate digital literacy (including AI) into their curriculum or, conversely, to ensure quality assurance processes consider AI usage. During the pandemic, some African education authorities had to regulate online exam proctoring tools; similarly, we might see regulations about AI usage in online education or accreditation criteria requiring policies on new tech.
2) **Open data and AI in research:** Some African nations promote open data and open science, which intersects with AI as well. Universities dealing with AI research or using AI might have to follow open science policies (making datasets available, which could help in transparency and reproducibility of AI models developed in academia).
3) **Labor laws and plagiarism laws:** Interestingly, outside of academic codes, some countries have laws criminalizing certain forms of academic misconduct (e.g., in Nigeria, exam malpractices can be prosecuted). If AI-assisted cheating is viewed as exam malpractice, conceivably such laws could apply, though that's speculative. Additionally, labor laws or faculty contracts may now start including clauses about using AI ethically in performing their duties (for example, not using AI to write recommendation letters or evaluations without disclosure, etc., which could be seen as neglect of duty).

Given these frameworks, African universities operate in a space where they must be cognizant of compliance (legal adherence) and aspirational alignment (with strategies and ethics). Many universities have legal offices or at least consult their education ministries on policy changes like those involving AI. As a result, institutional AI policies often cite or echo national/international principles. For

instance, a university senate guideline might reference the country's data protection law as a reason students must protect personal data when using AI or reference the university's commitment to the UNESCO AI Ethics as guiding its approach.

In summary, the legal and governance context in Africa is evolving quickly in relation to AI. There is momentum: from only two countries with AI strategies a few years ago [28] to a continental strategy and multiple national policies now, and from patchy data protection coverage to majority coverage now [1]. The trend is toward more structured governance of AI at all levels. This provides both support and pressure for universities. Support, in that frameworks can offer templates and resources (e.g., Rwanda's government working with its universities on AI research capacity, Ghana's multi-stakeholder approach including academia in strategy design [5]. Pressure, in that universities will be expected to align with these standards or face scrutiny. For instance, if a data breach happens through an AI tool, a university could face legal penalties under new laws, which heightens the importance of proactive measures we discussed.

Having examined the external context, we now transition to proposing a policy framework for AI integration in African HEIs that synthesizes our findings and aligns with both the internal needs and external expectations. This proposed framework aims to be forward-looking (future-proof), ethically grounded, and adaptable to the diversity of institutions in Africa, addressing many of the issues raised so far.

4.6. Towards a future-proof AI policy framework for African HEIs

Drawing on the insights above—the relatively low but growing prevalence of AI policies, the clear benefits and significant concerns, the varying readiness levels, the ethical challenges encountered, and the evolving legal landscape—we outline here a comprehensive policy framework for integrating AI in African higher education institutions. The goal of this framework is to provide guidance that is grounded in ethical principles and theory, flexible enough to apply to diverse contexts (from well-resourced universities to those with minimal ICT infrastructure), and robust against future changes in AI technology (future-proofing).

This framework is informed by resource dependence considerations (ensuring needed resources and managing external influences), diffusion strategies (promoting adoption through networks), and complexity thinking (building adaptive capacities). We present the framework in a structured manner, highlighting key components that institutions should incorporate:

4.6.1. Vision and principles: Each institution should start by articulating a clear vision for AI's role in its mission and a set of guiding principles to anchor all AI-related policies. The vision might be something like: *"To harness artificial intelligence to enhance learning, research, and administrative efficiency, while upholding academic integrity, equity, and our institutional values."* Guiding principles could include:

- **Human-centricity:** AI is used to augment human teaching and decision-making, not replace or diminish the human element. Human oversight is maintained on critical academic decisions (grades, admissions, etc.) [6].

- **Ethics and integrity:** AI deployment will uphold ethical standards, including honesty, transparency, fairness, and accountability. Misuse of AI (for cheating, deception, or bias) is unacceptable.
- **Equity and inclusion:** Ensure AI benefits are accessible to all students and staff and do not exacerbate digital divides or biases. Accommodations or training will be provided so that no group is left behind.
- **Privacy and security:** Personal and sensitive data will be protected in compliance with laws; AI systems will be vetted for data security.
- **Quality and academic freedom:** AI use will be aligned with maintaining academic quality and respecting the professional autonomy of educators. Faculty and students are encouraged to innovate with AI within the bounds of these principles.

Having these principles formally adopted (e.g., by the Senate or academic board) sets the normative foundation against which specific policies and decisions can be tested.

4.6.2. Governance structure: Institutions should establish a dedicated AI Governance Committee or Task Force that includes diverse stakeholders—faculty from different disciplines (including computer science and ethics), IT staff, administrators, student representatives, and possibly external advisors (e.g., from industry or policy bodies). This committee's role is to oversee the implementation of AI policies, monitor emerging issues, and update policies as needed (embracing complexity by enabling continuous feedback and adaptation). It would also coordinate with external bodies (like national AI task forces or the AAU) to stay updated on best practices. In resource dependence terms, this committee can help manage external relationships, e.g., negotiating partnerships with AI providers or securing grants for AI infrastructure, thus ensuring the university has resources to implement its AI vision. A point person or office (like a "Director of Digital Learning and AI") could be assigned to handle day-to-day matters and inquiries.

4.6.3. Policy on AI use in academics: A comprehensive academic AI policy should be developed, covering both teaching/learning and research. This would include: Guidelines for Students: Specify permissible and impermissible uses of AI for coursework. For example, *"Students may use AI-based tools for research, idea generation, proof-reading, and coding assistance, but must cite any significant AI contributions. All written assignments should reflect the student's own understanding; undisclosed AI-generated passages are considered plagiarism."* Provide examples of allowed vs. disallowed scenarios to make it concrete. Encourage students to discuss with instructors if unsure. Include the requirement that students sign an honor statement regarding AI use for major assessments.

- **Guidelines for faculty:** Encourage faculty to redesign assessments and incorporate AI in pedagogically sound ways. Provide a checklist or training on how to detect AI use and how to handle suspected cases (aligned with the academic integrity process). Faculty are also urged to disclose if they use AI in preparing course materials (for transparency, e.g., if lecture notes are AI-assisted) and to ensure accuracy. The policy should reassure faculty that they have backing from admin on dealing with AI

issues and also freedom to experiment with new methods, as long as learning outcomes are met.

- **Assessment and integrity measures:** Outline how the institution will handle violations—updating the academic misconduct code to include AI misuse. For instance, *"If a student is found to have submitted AI-generated work as their own, the case will be treated as plagiarism with equivalent penalties."* At the same time, emphasize educative responses for first-time or naive misuse (maybe requiring a workshop on proper use).
- **Use of detection tools:** If the university uses any AI detection software, clarify its role: e.g., *"Turnitin's AI detector may be used as an initial indicator, but any accusation will be thoroughly investigated by faculty; no student will be penalized based solely on an AI detection score"* [26,27]. This is important to maintain trust and fairness.
- **Encouraging innovation:** The policy can include positive encouragement, e.g., capstone projects or competitions involving AI solutions, provided ethical guidelines are followed, thereby not making policy purely restrictive but also enabling beneficial use.

4.6.4. AI in research and data management: Develop a policy or guidelines for AI in research. This covers two angles: using AI as a research tool and researching AI (for institutions that have AI R&D).

- **For using AI tools on research data:** Require compliance with research ethics and data protection. For example, if researchers want to use a transcription AI for interview data, they must ensure the service adheres to confidentiality per the ethics approval. Possibly provide a list of approved tools or require a data officer's clearance for new tools.
- **For publishing:** Suggest that authors note if AI tools were used significantly in generating results or text (some academic journals are starting to require this disclosure; the university can preempt by encouraging that transparency).
- **For AI research (like developing AI models):** Ensure such projects incorporate ethics-by-design, e.g., bias testing in models, and have multidisciplinary input (an ethics review for AI projects, similar to an IRB process even if human subjects aren't directly involved, because of societal impact). This ties to complexity—anticipating system impacts beyond the lab.
- **Data governance:** Reinforce that any personal data used for or generated by AI must be stored and processed according to the university's data policies. Possibly create institutional data repositories or sandbox environments for AI experimentation where security is managed.

4.6.5. Infrastructure and resource plan: Recognizing that not all African HEIs have the same resources, the framework should include a plan for infrastructure and capacity:

- **Connectivity & hardware:** Aim for improved internet bandwidth and computational resources to support AI applications (aligning with initiatives like providing campus broadband, maybe tapping into NREN

networks as mentioned where, for example, Kenya expanded connected campuses from 55 to 270 in a decade [8]). The framework can suggest engaging with government and donors (RDT strategy) to secure funding for ICT upgrades, positioning AI capacity as critical infrastructure for modern education.

- **Software and tools:** Decide which AI tools/services to adopt officially. Perhaps form partnerships with providers (e.g., Microsoft or Google often have academic programs for AI tools) to give students and staff access to reliable AI platforms under proper agreements. Alternatively, invest in open-source AI tools that can be locally hosted. The framework should be tech-neutral but insist that any tool used must pass data privacy and security checks by IT.
- **Support systems:** Create a help desk or support channel for queries about AI tools. If a student wants to use a certain AI app for a project, there should be someone to advise if it's safe or allowed. Also, technical support for implementing AI in teaching (like if a lecturer wants to incorporate an AI quiz system, the IT team can assist).
- **Monitoring & evaluation tech**: Over time, consider adopting systems to monitor AI-related activity trends (not individual surveillance, but aggregate data like how many submissions are flagged by detection, etc.) to evaluate policy effectiveness.

4.6.6. Capacity building and training: Invest in training programs for all stakeholders:

- **Faculty development:** Regular workshops or courses on *"Teaching in the era of AI",* sharing best practices on assessment redesign, demonstration of new tools, and sessions to discuss challenges (e.g., a seminar on dealing with AI plagiarism). Possibly incentivize faculty with certification or recognition if they upskill in AI literacy.
- **Student training & literacy:** Integrate AI literacy into the curriculum. This could be as a component of first-year orientation or a required general course on digital literacy, which includes AI. Topics should cover how AI works at a basic level, its pitfalls (so students understand why hallucinations happen or what biases exist), and how to use it responsibly for learning. Some universities globally have launched short courses for students on working with AI—African HEIs could adapt these. Additionally, provide online resources or tutorials, maybe even peer-led sessions (tech-savvy students mentoring others).
- **Administrative training:** Train non-academic staff as well—librarians, for instance, can learn about AI tools for information retrieval; writing center staff can learn to help students with AI-assisted writing in an ethical way; IT staff need deeper training to manage AI systems.
- **Collaboration and sharing:** The framework should encourage institutions to collaborate—share training materials, possibly co-host events (e.g., an inter-university symposium on AI in Education in East Africa, etc.). This leverages diffusion by network: universities helping each other rather than

reinventing wheels. It also can involve international partnerships; e.g., African universities partnering with universities abroad that have more experience for mentorship or resource sharing (like MOOC materials on AI ethics).

4.6.7. Addressing resource gaps and partnerships: Given resource dependence, the framework should explicitly include strategies to manage external support:

- **Seek partnerships with tech companies** for capacity support (but do so carefully to avoid over-reliance or letting them set the agenda—maintain agency as per RDT best practices). For instance, some tech companies run programs donating cloud credits or AI tools to universities—African HEIs can tap into those to build internal expertise.
- **Government engagement:** Universities should advocate for supportive policies and funding at the national level—if the education ministry sees that universities are proactively engaging with AI, it may provide grants for AI labs or curriculum development.
- **Regional consortia:** Work through bodies like AAU, SARUA, etc., to create shared frameworks. The AAU's highlighting of AI suggests an opening for collective bargaining or projects. For example, a joint project to develop an "AI in Higher Ed" toolkit tailored to Africa (maybe funded by the African Development Bank or World Bank) could emerge. The framework encourages such collaborative approaches, as they not only pool resources but also standardize quality across institutions (which helps with diffusion and trust).
- **Community and industry:** Include students and local startups in AI initiatives. Some African universities have innovation hubs; integrate AI challenges that involve students solving local problems with AI—this builds skill and shows positive impact, which in turn can rally more support and enthusiasm institutionally and publicly.

4.6.8. Continuous review and adaptation: Finally, the framework must be dynamic. It should establish that policies will be reviewed at least annually (or each semester) by the AI Governance Committee, with input from the community. Feedback loops could include surveys of faculty and students about AI's impact, collecting data on academic integrity cases, and tracking developments in AI tech (like new tools that require policy tweaks). Complexity Theory teaches that we can't predict all outcomes—maybe an initially strict rule might turn out unnecessary, or a new risk might surface—so the institution should be ready to iterate. Essentially, treat the AI policy framework as a *"living document."*

To ensure enduring relevance (one of the goals stated for this article), the framework should be forward-looking. For example, acknowledging that today's AI (like text-based ChatGPT) might evolve into multimodal AI or highly integrated systems in Office tools—the policies should be phrased in principle-driven ways to cover future cases, not just one platform. E.g., instead of "ChatGPT is banned in exams," say, "Use of any AI or automated system is prohibited in closed-book examinations unless explicitly allowed by the instructor." That phrasing covers future AI iterations.

Incorporating theory into the framework: This policy framework implicitly incorporates the theories:

- From diffusion of innovation, it encourages early adopters (the keen faculty) to share practices and thus influence peers (socialization of the innovation) and leverages networks (AAU, etc.) to spread and standardize policies. It also focuses on raising awareness and skill, which, in diffusion terms, increases the perceived advantage and lowers the complexity of the innovation.
- From resource dependence, it calls for managing dependencies by diversifying support (multiple partnerships, government ties, consortiums) so the institution isn't at the mercy of one vendor or one policy directive. It also ensures the institution shapes the narrative, via its vision and principles, rather than passively receiving whatever technology comes, thus negotiating with the environment.
- From complexity, it explicitly builds adaptive review and multi-stakeholder governance, which makes the system more resilient and capable of self-correction. It avoids rigid one-time solutions and fosters a culture of learning and feedback.

By implementing such a framework, African universities can stride towards an approach to AI that is not merely reactive but proactive and strategic. It would help institutions maximize AI's benefits (improving education and efficiency) while minimizing harms in a way that aligns with African values and contexts. Moreover, a well-governed adoption of AI could become a competitive advantage for African universities—attracting students who want a modern education, producing graduates skilled in AI, and engaging in research that addresses African problems with AI solutions.

This framework is, of course, a general guideline. Each institution will need to tailor it to its reality—Complexity Theory reminds us context matters—but having a common vision across the continent means institutions can also speak in unison on global stages about how Africa is handling AI in education, potentially influencing the global discourse.

4.7. Proposed framework for AI governance in African higher education

Drawing on our analysis of current institutional practices, stakeholder concerns, and the broader regulatory environment—as well as the guiding theories of Resource Dependence, Diffusion of Innovation, and Complexity—this section outlines a proposed policy framework for ethical, scalable, and future-proof AI governance in African universities. The framework is structured around five interdependent pillars, each addressing a core governance dimension.

4.7.1. Pillar 1: Ethical guidelines and integrity systems: This pillar emphasizes the development of clear, enforceable, and contextually appropriate ethical guidelines governing AI use in teaching, learning, research, and administration

- Develop institutional policies that explicitly address AI-assisted plagiarism, authorship, and academic honesty.
- Integrate AI ethics into academic integrity codes, using student-friendly principles (e.g., UJ's RITE model).
- Require AI-use disclosures in academic submissions and research publications.
- Align institutional codes with national and international AI ethics principles, including UNESCO's Recommendation on the Ethics of AI and national laws such as POPIA or NDPR.

Theoretical grounding: RDT underscores that external stakeholders (e.g., funders, accreditation agencies) increasingly demand visible ethical safeguards; this pillar ensures compliance and legitimacy.

4.7.2. Pillar 2: Capacity building and digital literacy: Universities must build human capacity at all levels to ensure responsible AI use

- Provide AI literacy training for faculty, administrators, and students, tailored to local digital competencies and disciplinary needs.
- Establish faculty development programs on AI pedagogy, detection tools, and critical use.
- Incorporate AI ethics, applications, and limitations into the general curriculum (e.g., as modules or electives).
- Engage student unions in co-developing awareness campaigns on responsible AI use.

Theoretical grounding: Diffusion of Innovation Theory suggests adoption spreads through social learning and peer influence. Training early adopters creates internal advocates who accelerate policy uptake.

4.7.3. Pillar 3: Infrastructure and technical enablement: Ethical intentions cannot be implemented without the necessary digital and institutional infrastructure

- Invest in secure, equitable access to AI tools and internet infrastructure.
- Prioritize low-bandwidth and open-source AI solutions adaptable to resource-constrained settings.
- Develop in-house or consortium-based AI models to protect data sovereignty.
- Ensure IT departments and legal units are trained to assess AI vendor contracts, privacy compliance, and cybersecurity risks.

Theoretical grounding: RDT highlights that access to AI tools and infrastructure is often externally constrained; joint procurement models can reduce dependency and increase institutional bargaining power.

4.7.4. Pillar 4: Adaptive governance and policy flexibility: AI is a rapidly evolving field; governance must reflect this dynamism

- Adopt living policy documents that can be updated regularly in response to technological change and user feedback.

- Form multi-stakeholder AI governance committees that include faculty, students, IT, legal officers, and ethics experts.
- Establish pilot testing protocols for AI tools before campus-wide rollout.
- Monitor AI impacts continuously through feedback loops, surveys, and quality assurance audits.

Theoretical grounding: Complexity Theory advocates for iterative, learning-based policy approaches in unpredictable systems. Static regulations risk obsolescence; adaptive governance increases resilience.

4.7.5. Pillar 5: Regional collaboration and policy alignment: No institution is an island. Regional partnerships are key to capacity-sharing, benchmarking, and policy harmonization.

- Align university policies with national AI strategies and continental frameworks (e.g., the African Union's AI Strategy).
- Join regional associations (AAU, SARUA, RENU, etc.) for coordinated training, policy templates, and tool-sharing.
- Participate in open research collaborations focused on AI in African education.
- Establish national or regional AI observatories to track institutional compliance, innovation, and risks.

Theoretical grounding: Diffusion theory indicates that networks and peer institutions influence adoption curves. By collaborating, African HEIs can shape regional AI norms and standards.

4.7.6. Illustrative framework model

As illustrated in **Figure 3** below, we propose a pentagon model that visualises the interdependence of the five pillars:

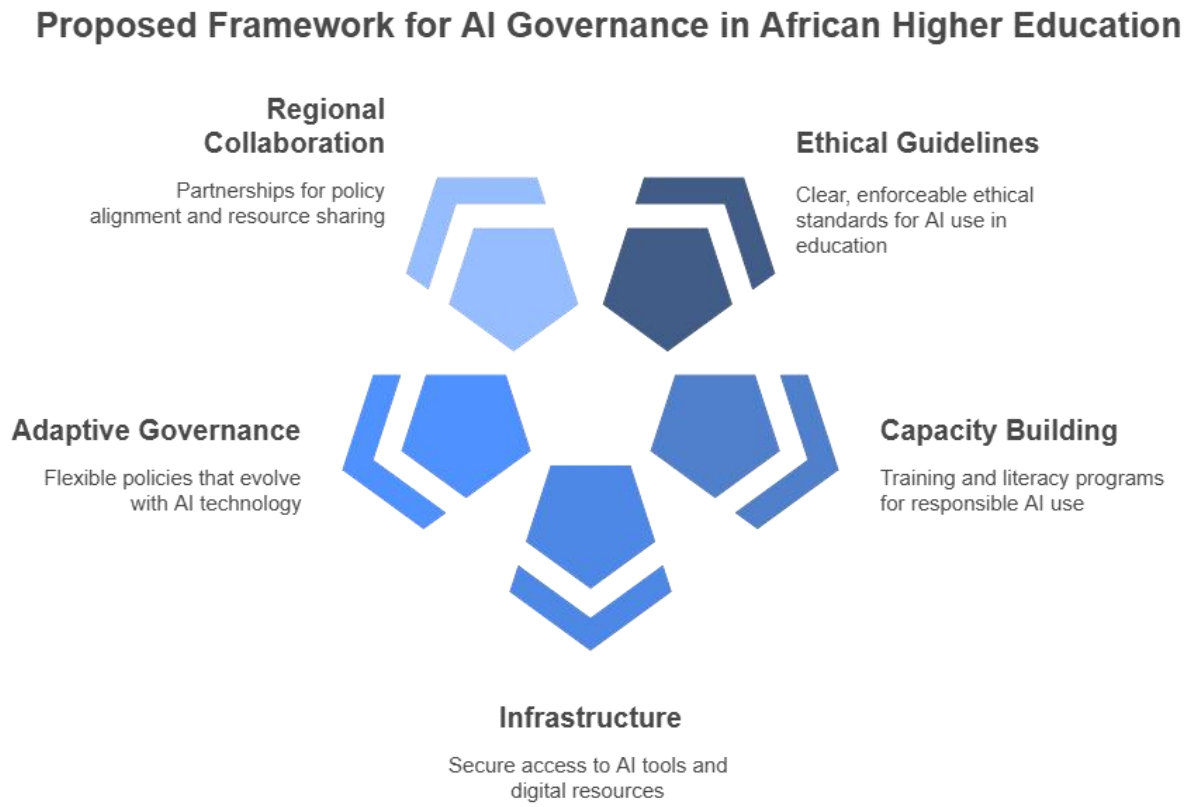
Proposed Framework for AI Governance in African Higher Education
Regional Collaboration
Partnerships for policy alignment and resource sharing
Ethical Guidelines
Clear, enforceable ethical standards for AI use in education
Adaptive Governance
Flexible policies that evolve with AI technology
Capacity Building
Training and literacy programs for responsible AI use
Infrastructure
Secure access to AI tools and digital resources

Figure 3. Five-pillar policy framework for future-proof AI governance in African higher education. Pentagon model illustrating the interdependence of: (1) Ethical Guidelines & Integrity Systems, (2) Capacity-Building & Digital Literacy, (3) Infrastructure & Technical Enablement, (4) Adaptive Governance & Policy Flexibility, and (5) Regional Collaboration & Alignment. The outer arrows emphasize continuous feedback loops and iterative refinement. Source: authors' illustrative framework derived from study findings and theoretical synthesis.

In the next section, we conclude by summarizing key recommendations and highlighting areas for future research that emerged from this study.

5. Conclusion and recommendations

5.1. Conclusion: African higher education stands at a critical juncture in the face of the AI revolution. This deep investigation has revealed that while only a minority of African universities currently have formal AI governance policies, there is widespread recognition of both the transformative potential and the serious challenges that AI brings to academia. Educators and students in Africa are already experimenting with AI tools—leveraging them to support learning and research—even as institutional frameworks catch up. The benefits are tangible: personalized learning assistance, efficiency gains, expanded research capabilities, and bridging of language gaps. Yet, the concerns are equally pressing: threats to academic integrity, the reliability of AI-generated information, data privacy risks, and the capacity of institutions to manage this technology responsibly. Our analysis, grounded in Resource Dependence Theory, Diffusion of Innovation, and Complexity Theory, underscores that the successful integration of AI in African HEIs will require careful balancing of external pressures and resources, proactive diffusion of knowledge and best practices, and adaptive governance that can respond to an evolving landscape.

Many African universities operate under resource constraints, but they are not operating in isolation—national strategies and continental initiatives (like the AU's AI Strategy) are paving a supportive path, and global ethical frameworks are available as guides. The experiences of early adopters, particularly in South Africa, provide valuable lessons: a nuanced approach that neither bans nor uncritically embraces AI, but instead sets guardrails and educates users, is emerging as the preferred path. This approach resonates with the complexity of educational ecosystems; it accepts that AI is here to stay in some form and focuses on shaping its use in line with pedagogical values and societal norms. It also aligns with the diffusion principle of leveraging innovators to lead—those universities that have moved early on AI governance can serve as mentors and models for others on the continent. Meanwhile, Resource Dependence Theory reminds us that African HEIs should actively seek collaborations and support (from governments, industry, and international partners) to build the needed capacity—the goal should be to not let lack of resources dictate a passive stance on AI, but rather to mobilize resources by demonstrating commitment and vision.

In conclusion, African higher education institutions have an opportunity to "leapfrog" by thoughtfully integrating AI—potentially improving quality and access in ways that traditional methods could not—but this will only yield positive outcomes if governed with foresight and care. The stakes include the integrity of academic qualifications, the trust in scholarship, and the preparedness of graduates for a world where AI is ubiquitous. African universities must ensure that AI becomes a tool for empowerment and innovation, not a source of new inequities or erosion of academic standards. This requires strategic action now, while the technology is still in its relative infancy in the academic context, to set patterns that will endure.

5.2. Recommendations: Based on our findings and the proposed framework, we offer the following key recommendations for African higher education institutions and their stakeholders:

1) **Develop and implement institutional AI policies:** Every African university should initiate a process (if not already done) to develop an AI governance policy tailored to its context. This policy should cover the use of AI in teaching, learning, assessment, and research, drawing on the components outlined in our framework (ethical principles, academic guidelines, integrity measures, etc.). Institutions
2) **Develop and implement institutional AI policies:** Every African HEI should establish a formal policy or guidelines on the use of AI in academics. This policy must clearly define how students and faculty may use AI in coursework and research and what constitutes misuse. It should draw on existing academic integrity rules (e.g., treating undisclosed AI-generated work as plagiarism [4], while also encouraging positive use cases (such as using AI for drafting or study aids with proper attribution). Early-adopting universities have shown that having such guidelines in place provides much-needed clarity and confidence for both instructors and students [14]. Institutions that have not yet formulated an AI policy should urgently form committees (including students and IT staff) to draft one, learning from the models already published by peers (see Appendix A for examples). A written policy should be communicated widely—

in student handbooks, course syllabi, and faculty workshops—so that everyone understands the do's and don'ts of AI use on campus.

3) **Provide training and build capacity:** Universities must invest in AI literacy and capacity-building for all stakeholders. This includes workshops for faculty on integrating AI into pedagogy and assessment design so they can harness tools like ChatGPT for lesson planning or feedback while preventing misuse [37]. Students should receive orientations on how to use AI productively (for learning, brainstorming, and improving writing) and ethically, with emphasis on critical evaluation of AI output [4]. We recommend that institutions develop short courses or online modules covering AI fundamentals, ethical issues, and hands-on practice—potentially as part of first-year orientation or as a required general course. Libraries and writing centers can play a role by offering guidance on research and writing with AI assistance. Administrative and IT staff also need upskilling to manage new tools and data practices. Where resources are limited, universities can collaborate, through AAU or regional bodies, to create shared training content and trainer-of-trainers programs, leveraging collective expertise. Building internal capacity will reduce reliance on external expertise over time and help universities adapt to new AI developments.
4) **Strengthen academic integrity systems:** Universities should bolster their academic integrity mechanisms in light of AI. Honor codes or integrity pledges should be updated to mention AI (students might sign a statement for each exam or assignment affirming they did not use unauthorized AI assistance). Educators should be supported with tools and techniques to detect AI-assisted cheating—for instance, training in recognizing writing inconsistencies or using detection software as a secondary check [26,27]. However, given the imperfections of detection tools, we recommend a balanced approach: use software flags as a starting point, but always have a human academic review the evidence and give students a chance to explain. Universities might create an "AI integrity board" or expand the mandate of existing honor councils to handle cases specifically related to AI, ensuring consistent and fair adjudication. Importantly, an emphasis on assessment reform is key: move toward forms of evaluation that are less prone to AI abuse (e.g., oral exams, in-class writing, personalized projects) or that even incorporate AI use in the process (so that using AI ethically is part of the skill being assessed). This not only thwarts dishonesty but also aligns assessments with real-world practices.
5) **Enhance technological infrastructure and access:** To truly integrate AI in an equitable way, many African universities will need upgrades in their IT infrastructure. We urge institutional leaders and policymakers to prioritize connectivity (broadband internet, campus Wi-Fi) and hardware provision (computer labs, lending programs for devices) so that all students have the means to access AI tools, not just the privileged few [8]. Creative solutions can include partnering with telecom providers for educational data bundles, setting up AI resource centers on campus, or leveraging national research and education networks for high-speed access. Moreover, institutions should consider providing access to approved AI software (perhaps through campus

licenses or open-source platforms) in a controlled, privacy-compliant manner. For example, a university might deploy a local instance of an AI writing assistant for students to use, which could be configured to not retain data—this gives students a safe and sanctioned tool. Donors and government funding should be sought to support these infrastructure improvements, framing them as essential for 21st-century education. Without narrowing the digital divide on campus, any AI policy will inadvertently favor those with better tech access, exacerbating inequalities it should solve.

6) **Ensure data protection and privacy compliance:** Universities must treat data governance as integral to AI governance. We recommend that each HEI conduct a review of how using AI tools might involve student or staff data and take steps to remain compliant with national data protection laws (which many African countries now have) [1]. Concretely, this means vetting third-party AI services' privacy policies, possibly negotiating data processing agreements, and steering users toward privacy-friendly settings (as seen in advice to disable chat history when using ChatGPT [14]. Sensitive information should never be fed into public AI tools without safeguards. IT departments should update university guidelines on cloud services to include AI—e.g., prohibiting use of university-issued sensitive data with any external AI service unless approved. If feasible, universities should opt for self-hosted or locally controlled AI solutions for activities involving personal data. We also encourage HEIs to appoint or consult data protection officers when crafting AI-related rules to ensure alignment with frameworks like POPIA, NDPR, or the Malabo Convention. By building strong privacy practices now, institutions will protect their communities and avoid legal pitfalls as AI use grows.
7) **Collaborate and share best practices:** Given the novelty and complexity of AI governance, African universities will benefit from collaboration. We recommend forming inter-university working groups or communities of practice on AI in education. This could be facilitated by bodies like the AAU or regional networks (e.g., East African, West African university associations). Such collaboration allows sharing of policy templates, success stories, and even failures, so others can learn and adapt. Joint workshops or conferences (virtual ones can save costs) on AI pedagogy or creating an online repository of resources (policies, curricula, case studies) would accelerate diffusion of Innovation across the sector. international partnerships can also be valuable: African HEIs should engage with global initiatives (like UNESCO's AI in education program or OECD forums on education governance) to both contribute African perspectives and draw on international experience [6,15]. By speaking as a collective, African universities can also have a stronger voice in global AI ethics discussions, ensuring that solutions are not one-sided. In sum, networking and knowledge-sharing will reduce duplication of effort and elevate the overall standard of AI governance across institutions.
8) **Align with national and continental strategies:** Universities should actively align their internal efforts with national AI strategies and the African Union's continental strategy. This alignment can unlock support and ensure coherence. For instance, if a country's AI policy emphasizes developing local AI talent and

calls for an AI curriculum in universities, HEIs should integrate that into their strategic plans and seek any available funding or programs attached to it. Likewise, universities can play a role in national policy consultations—their on-the-ground experience is valuable for policymakers. We recommend that university leadership establish channels with their education ministry or ICT ministry to stay informed and influence policy (e.g., participating in task forces or providing expert feedback on draft laws). The AU's strategy aims for unity and capacity building; universities could lobby through the AAU for regional funding to, say, create Centers of Excellence in AI Education or to develop localized AI tools (like language models for African languages), which could then be shared. Aligning with broader strategies will help universities future-proof their AI integration—as laws or regulations emerge, aligned institutions will already be in step and can avoid compliance scrambles. It also reinforces resource dependence management: being in sync with government priorities often makes it easier to secure support.

9) **Foster an adaptive, ethics-focused institutional culture:** Beyond formal policies and tools, the culture of the university community will ultimately determine how successfully AI is integrated. Institutions should foster a culture that values academic honesty, critical thinking, and innovation. This means continually engaging students and staff in dialogue about the impact of AI. We recommend periodic forums, hackathons, or ethics debates on AI where the community can discuss scenarios and moral dilemmas (e.g., "Should AI ever be listed as co-author on research?" or "How to handle AI errors in the classroom?"). Such activities keep ethical considerations at the forefront and involve students as partners in shaping norms. By treating students not just as subjects to be policed but as participants in finding solutions, universities will get buy-in and adherence to governance measures [4]. Complexity Theory suggests embracing this bottom-up input, as it can reveal emergent issues early. Administrators should be open to refining rules as new information comes in—for example, if students identify a new form of AI misuse, act quickly to address it. An ethical, adaptive culture also means celebrating positive uses of AI: share success stories of students who used AI to improve their work ethically or faculty who did novel projects with AI. This positive reinforcement helps steer the narrative from fear to responsible empowerment.

By implementing these recommendations, African higher education institutions can create an environment where AI is used thoughtfully and constructively. Policies and technical fixes alone are not enough; leadership and community values play a decisive role. Fortunately, African universities have a track record of resilience and innovation under constraints—applying those qualities to AI governance can ensure that the continent not only catches up in this domain but potentially leads in demonstrating how to integrate AI in education in a principled, inclusive way. The journey will require ongoing effort, learning, and collaboration, but the result will be institutions that are future-ready—capable of producing graduates who are adept at leveraging AI for societal good and new knowledge that pushes AI to serve Africa's development needs.

5.3. Future research

This study has shed light on many aspects of AI governance in African higher education, but it also raises further questions that merit investigation. We outline here several avenues for future research to build on our findings:

- **Empirical impact studies:** As more African universities implement AI policies and tools, there is a need for empirical studies evaluating their impact. Future research should examine, for instance, the outcomes at universities that have embraced AI in classrooms versus those that have been restrictive. Do students in "AI-positive" learning environments show improved skills or learning gains? How do academic integrity incident rates compare before and after policy implementation? Such studies (perhaps using quasi-experimental designs across institutions) would provide evidence on what governance approaches yield the best educational outcomes and could inform policy refinement.
- **Case studies of institutional change:** Detailed qualitative case studies of individual African universities navigating AI adoption would be valuable. These could document the process of policy development (Who initiated it? What debates occurred?), the challenges in implementation, and the role of context (culture, leadership, resources) in shaping outcomes. Comparing a large, research-intensive university with a smaller, teaching-focused college, for example, could illuminate different barriers and enabling factors. Such research can also apply our theoretical lenses in depth—examining, say, how resource constraints in one case or complex stakeholder dynamics in another influenced their AI strategy. This would enrich the academic literature on technology adoption in higher ed with Africa-centric insights.
- **Students' and faculty's evolving perceptions:** Longitudinal research tracking how student and faculty attitudes toward AI change over time in African HEIs would be insightful. Surveys and interviews conducted periodically (e.g., annually) could capture whether initial fears decrease as people become more familiar with AI or whether new concerns emerge with experience. Understanding perception dynamics can help tailor training and support—for instance, if faculty initially overestimate AI's risks, education can alleviate that; or if students become overconfident in AI, curricula can emphasize critical thinking more. Moreover, such research should segment responses to see if there are differences by discipline, gender, or other factors in how AI is viewed.
- **AI adaptation for African contexts:** Technical research that feeds into governance is also needed—specifically, research on developing AI tools that align with African educational needs and values. For example, studies on AI models that work well in low-bandwidth settings or AI that can code-switch in English and local languages within educational content would be highly beneficial. Likewise, research on bias mitigation in AI using African data sets can inform universities on what tools are safest to use. Interdisciplinary teams in African universities should be encouraged (and funded) to work on "AI for education in Africa"—their findings can directly impact policy by providing home-grown solutions (reducing dependence on foreign tools) and by identifying what ethical issues are most salient in the African context.

- **Governance and policy analysis:** From a public policy perspective, more research is needed on the governance models for AI in education at national and institutional levels. Comparative analyses of policy frameworks across multiple countries (e.g., comparing how Kenya, South Africa, and Nigeria's universities are handling AI governance under different national policies) could reveal how macro-policy translates (or doesn't) to micro implementation. Additionally, exploring legal research questions—such as the implications of African data protection laws on the use of student data in AI or intellectual property rights of AI-generated academic materials—would provide clarity in areas that our broad analysis could only touch on. Such legal scholarship can guide universities in fine-tuning their policies to be compliant and forward-looking.
- **Theory development in an African context:** Our use of RDT, diffusion, and complexity theories was intended to frame the analysis, but future research could test and refine these theories in the specific context of African higher education and AI. For instance, researchers could quantitatively test diffusion theory by modeling the adoption of AI policies across universities as a function of networks or exposure or examine resource dependence by correlating the level of external funding with the sophistication of AI initiatives at universities. Complexity Theory could be explored through system mapping—mapping out all actors (students, faculty, admin, government, tech companies) in a country's higher education AI ecosystem and analyzing the emergent outcomes. This not only contributes to academic theory but also helps practitioners understand the system relationships better.

In summary, there is a rich agenda for research at the intersection of AI, education, and governance in Africa. Pursuing these questions will not only support universities in effective AI integration but will also ensure that the global discourse on AI in education includes African experiences and voices, which have historically been underrepresented. By continuously studying and learning from the rollout of AI governance, stakeholders can iterate towards models that truly serve the goals of quality, equity, and innovation in African higher education.

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